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PHOTOGRAPH BY KATE BROOKS

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FROM THE EDITOR

Reconsiderations

Botched battles and preconceptions overturned

BY CAREY WINFREY

CAITLIN O'CONNELL-RODWELL, a Stanford ecologist and author of *The Elephant's Secret Sense*, has been studying elephant behavior since 1992, primarily in Namibia's Etosha National Park. In "Male Bonding" (p. 50), she describes a hair-raising confrontation between two bull elephants that overturned all her preconceptions—and the conventional wisdom—about challenges to pachyderm hierarchy. "I thought for sure I was going to see the dominant bull get displaced by the bull in musth," she says. "When I didn't, I realized that social structures are not all black and white; once you start focusing, you see there is a lot of gray. There are all these fascinating soap operas to try to figure out." The biggest challenge with studying elephants is time—they can live up to 70 years in the wild. "Every year there are different dynamics within a social group, but if you have enough years to string together, you can see how relationships are shaped and how they are maintained—or not."

MAX SALOMON

O'Connell-Rodwell at work

THOMAS POWERS is best known for his probing dissections of the CIA and other intelligence agencies. His latest book, *The Killing of Crazy Horse*, from which "How Little Bighorn Was Won" (p. 82) was adapted, would seem a departure. It's a moment-by-moment account of the battle that cost George Armstrong Custer and his men their lives—told from the Indian point of view. But as with his earlier books, Powers had to piece the story together like a puzzle. "The most challenging thing," he says, "was to stop trying to figure out what Custer did and start listening to the Indians. When you do that, everything becomes much simpler. It stops being a mystery; after all, there were thousands of Indians but only some 200 soldiers under Custer."

Powers was stunned by the soldiers' callousness—and ineptitude. "They raced across the country to attack these Indians, who were not at war with them and were not threatening them in any way. They were attacked out of the blue, basically, by soldiers who didn't know who they were attacking, didn't know the lay of the land and didn't know how to reach the Indians. That was startling to realize, that this thing was such a complete botch. I promise there will be 10,000 guys out there that will rise up and want to lynch me because they don't like to think of Custer that way."

Smithsonian magazine 8TH ANNUAL PHOTO CONTEST

A REMINDER: SMITHSONIAN's 8th annual photo contest closes December 1, 2010, at 2 p.m. E.S.T. Visit Smithsonian.com/photocontest to enter your photographs and to view past winners and finalists.

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RUDY SULGAN/CORBIS

The marquee outside the famous Apollo Theater.

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mfa BOSTON

60-minute guides to top museums

#2 in a series

Inspiration and Accomplishment Tour

The Art of the Americas Wing opens on November 20, with 53 brand-new galleries that double the number of objects from the collection on view, including several large-scale masterpieces not displayed for decades. The new wing takes a global perspective on Art of the Americas, showcasing more than 5,000 works of art produced in North, Central, and South America over the course of three millennia. The Museum's director, Malcolm Rogers, shares some of the highlights.

Your Guide

Malcolm Rogers, Ann and Graham Gund Director

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Open seven days a week:
Mon–Tues 10 am–4:45 pm
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Olmec Mask

1150–550 BC, Mexico

One of the finest Olmec masks in a public collection, the naturalistic features of this masterpiece recall monumental Olmec stone heads. The mask was originally green; the gray color was caused when it was put in a fire, as part of a religious ritual.

Location: Ancient Central American Gallery

John Singleton Copley

Paul Revere, 1796

This portrait of silversmith and patriot Paul Revere hangs in a gallery along with the finest works produced in Colonial Boston in the formative decades preceding and following the American Revolution. It is displayed near Revere's silver *Liberty Bowl*.

Location: Carolyn A. and Peter S. Lynch Gallery / Colonial Boston

John Singer Sargent

The Daughters of Edward Darley Boit, 1882

This masterpiece is a highlight of a new gallery devoted to the MFA's superb collection of works by John Singer Sargent. The gallery complements Sargent's murals in the Museum's historic building.

Location: Ruth and Carl J. Shapiro Gallery / Sargent

Louis Comfort Tiffany and Tiffany Glass and Decorating Company

Parakeets and Gold Fish Bowl, about 1893

The richly installed galleries of 19th and early 20th-century art include furniture, paintings, ceramics, sculpture, and objects, including this spectacular stained-glass window by Louis Comfort Tiffany.

Location: Robert P. and Carol T. Henderson Gallery / Aesthetic Movement

Harriet Powers

Pictorial Quilt, 1895–98

A richly varied gallery speaks to America's fertile artistic imagination, evident in the creative work of artists and artisans with a range of formal training. This quilt by former slave Harriet Powers is a highlight of the gallery.

Location: Joyce and Edward Linde Gallery / Life in America: Folk Art

César Paternosto

Staccato, 1965

The third level of the wing is devoted to art from the 20th century through the mid-1970s. This bold, vibrant oil by Argentinean César Paternosto is on view in the third floor's spectacular central gallery.

Location: Saundra and William H. Lane Gallery / Abstraction: A Revolution

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LETTERS READERS RESPOND TO THE **SEPTEMBER** ISSUE

My husband, an Asian Indian, is often asked about his origins ["So Where You From?"]. He replies with a grin, "My mother." "Really?" the stranger says. "I'm quite sure," my husband says.

P. S. DASTOOR, FARMINGTON, MISSOURI

SMALL-TALK AMERICA

I AM AN IMMIGRANT from the Dominican Republic with a thick accent, and I am constantly asked where I am from ["So Where You From?"]. I do not see it as an inquisition but as a wonderful icebreaker and an opportunity to share my heritage. I am a world traveler and like to relate my experiences. Had I met the author, Iva Skoch, I would have asked where she's from. Upon hearing Czech Republic, I would have told her how much I enjoyed her country, how beautiful Prague is with its historic architecture and about my love of Alphonse Mucha's art. I hope she will warm to American ways and welcome our interest in other cultures.

MARGARITA BERGEN
NEW ORLEANS, LOUISIANA

MENTAL STABILITY

AS A FORMER CIRCUS stilt walker, I've spent many hours observing various animals and their interactions with people. Jon Cohen's article ["Thinking Like a Chimpanzee"] comparing chimpanzees and human beings answered questions that I've pondered for years. Tetsuro Matsuzawa, the primatologist, says the main distinguishing feature that contributes to our superior mental capability is "the stabile supine posture," but he also says muscles shaped our minds. That revelation should, at the very least, encourage us to put a greater value on physical education in schools.

ELLEN COX
GRANADA HILLS, CALIFORNIA

DUBIOUS WOODPECKER

FAR FROM ADDING weight to ornithologist James T. Tanner's claim of observing an ivory-billed woodpecker in 1938 ["The Rarest Bird"], the recently found photographs seem to raise new doubt. The nestling in the pictures appears to be neither "clambering" nor "vital," as the article states, but posed and static. The open bill and the rigid conformity of head, neck and overall body posture in each photo resemble a creation of taxidermy. I am not claiming that the bird is a fake but commenting on the choice of photos included in the article, all of which show the bird in essentially the same posture. I strongly urge you to make all 14 images available for public inspection.

STEVEN PATTERSON
ALLENTOWN, PENNSYLVANIA

To see all the newly discovered ivory-billed woodpecker photographs go to Smithsonian.com/woodpecker. —Ed.

HIDDEN TALENTS

AS A CLINICAL psychologist familiar with mediumship, a topic covered fairly and responsibly in "Ghost Writer," I wish to add that unconscious talents of any kind tend to emerge in stages and may at their inception seem alien to both the individual involved and to others. Patience Worth's statement that she lived two centuries earlier and a continent away can thus be read as indicating the psychological distance between Pearl Curran's dormant talent and her conscious personality. She was unusual in her ability to integrate her latent literary gifts into her conscious self. She became less dependent on the Ouija board and trances and more able to speak directly. Given the positive reviews of Worth's writing, I would have appreciated the inclusion of more examples of it.

MEREDITH SABINI, PHD
BERKELEY, CALIFORNIA

For samples of Worth's literary output, go to Smithsonian.com/patience. —Ed.

PARANOID PUBLIC

I WAS STRUCK by the phrase "tragically misguided actions by our government" in reference to the World War II Japanese internment [From the Castle: "Lest We Forget"]. The government acted because we the people demanded it. Paranoia wiped out any common sense or realistic look at individuals. Paranoia always nudges people toward extremism. We might be interning Muslims this very day if extreme views were allowed to dominate the discourse. Fortunately, the paranoia currently festering is not yet sufficiently widespread to repeat our earlier mistake.

ARTHUR HILLS
SANTA ROSA, CALIFORNIA

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On to Warsaw

As German bombs began falling on Poland in 1939, an American photographer made a fateful decision

BY MIKE EDWARDS

Zygmunt Aksienow rescued a caged canary as a "sign of the normal life I was used to."

LIKE OTHER members of his generation, Julien Bryan would never forget where he was or what he was doing when he learned that Germany had invaded Poland. But Bryan had a better reason to remember than most: on that September 3, 1939, he was stopped at what was then the Romanian-Polish border on a train bound for Warsaw.

"Why, at this moment, I did not turn around . . . I do not know," Bryan would recall of learning of the invasion two days after the onslaught began. With bombs exploding nearby, the train resumed its cautious journey toward the capital—with Bryan on board for a front-row seat at the commencement of World War II.

Bryan, who came from Titusville, Pennsylvania, had seen combat as a 17-year-old ambulance driver in France during World War I. After graduating from Princeton, in 1921, he traveled widely, taking photographs and making travelogues or human-interest films along the way. That summer of 1939, he had been shooting peasant life in Holland. On September 7, he disembarked in predawn darkness in besieged Warsaw.

"I was in a city about to face perhaps the worst siege of all modern history," Bryan would write. Other cities, of course, would suffer terrible assaults later in the war—Lon-

That September 9, Bryan (above left: with interpreter Stephan Radlinski, center) was arrested as a German spy—but released once the arresting officer saw that Bryan was a U.S. citizen. Aksienow (below: in 2009) recalls the privations of the following winter.

don, Berlin, Hiroshima and many more—but early on, Warsaw was hit by wave after wave of modern bombers, to which the German Army added what Bryan called the "hot steel spray" of exploding artillery as it advanced.

While the retreating Polish Army valiantly resisted the advancing German columns, Warsaw's 1.3 million inhabitants were subjected to furious bombardment. Hospitals, churches and schools were hit. Bryan wrote that a 40-unit apartment building "looked as if a giant with an ice-cream scoop had taken out the entire central section." Homeless families crowded the streets, pushing what remained of their belongings in wheelbarrows and baby carriages.

All this was happening, essentially, out of the world's sight; Bryan was the sole foreign journalist left in the city. He acknowledged the journalistic tingle of getting "a grand scoop," but he also recognized the historical imperative to capture the horror of modern warfare for the world to see. "I was not," he realized, "making a travelogue."

Bryan walked the streets with a Leica still camera and a Bell & Howell movie camera. Day by day the job grew riskier. He confessed that he and his Polish interpreter, Stephan Radlinski, often wanted to run when a bomb landed close by. "But neither of us ran, because each was afraid of what the other might think," he wrote. On Rosh Hashana, the Jewish New Year, incendiary bombs set 20 blocks of the Jewish quarter aflame.

Among shattered buildings near the Vistula River, Bryan took several frames of a boy clutching a bird cage.

Twenty years later, after Bryan republished his photographs in a local newspaper, Zygmunt Aksienow identified himself as the boy in the photograph. Now 80, Aksienow recalls that two large bombs had fallen near his family's apartment building and "the street was full of broken glass, furniture and parts of human bodies." A bird cage "blew out of a house, along with a window" and landed in the rubble. Aksienow picked it up, thinking that the canary it held—very much alive—might belong to his cousin Zofia, a neighbor. "I was a scared 9-year-old, out looking for some sign of the normal life I was used to," he says today.

Aksienow, who would grow up to be a coal miner, no longer recalls what happened to the canary, but he remembers clearly the cruel winter that followed the invasion. His family's apartment had been heavily damaged and food was scarce, but just before the traditional Christmas Eve feast, young Zygmunt walked in with two buckets of fish, which he and a pal had stunned by tossing a hand grenade they'd found into the Vistula.

Bryan had no idea how he might get out of Warsaw. But on his 14th day there, the Germans declared a cease-fire to allow foreigners to depart by train through East Prussia. Certain that the Germans would confiscate any photographs of the destruction they had wrought, Bryan resolved to smuggle his film out. He gave some to departing companions to hide in their gear, and by one account wound yards of movie film he had the foresight to have processed in Warsaw around his torso. After reaching New York City, he reassembled an awesome trove: hundreds of still negatives and more than 5,000 feet of motion picture film.

That autumn, U.S. newspapers and magazines splashed Bryan's photos across their pages. *Life* magazine printed 15 of his images, its weekly rival, *Look*, another 26—including the one of Aksienow with the caged canary. In 1940, Bryan put together a book about his experience, titled *Siege*; his documentary of the same name was nominated for an Academy Award.

Bryan died in 1974, just two months after receiving a medal from the Polish government for his still photography, which is preserved at the U.S. Holocaust Memorial Museum in Washington, D.C. His Warsaw film is listed on the Library of Congress' National Film Registry as a "unique, horrifying record of the dreadful brutality of war."

MIKE EDWARDS *was a writer and editor for* National Geographic *for 34 years.*

JULIEN BRYAN; MIKE EDWARDS; PP. 10-11 JULIEN BRYAN

WILD THINGS

LIFE AS WE KNOW IT

BY T.A. FRAIL, MEGAN GAMBINO, LAURA HELMUTH, JESSE RHODES AND JESS RIGHTHAND

PARACHUTING CATERPILLARS

Caterpillars that live in treetops typically crawl or jump or rappel down silk threads to the ground, where they spin cocoons. But one nettle caterpillar goes its own way, according to a new study in the *Journal of Insect Science*. Larvae of the moth *Scopelodes contracta*—found in Japan, China and India—nibble through a leaf to detach it from the stem. The caterpillars cling to the leaf as it floats to the ground, as if riding down on a parachute.

WEB MASTER

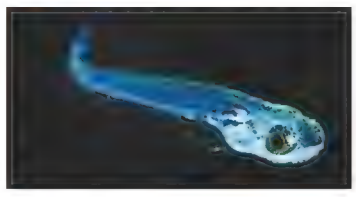
A species of bark spider recently discovered in Madagascar spins the largest webs ever recorded—up to 82 feet wide—over streams, rivers and lakes. Named *Caerostris darwini* after Charles Darwin, the spider has evolved exceptionally tough silk for "bridgelines," which anchor its giant, orb-shaped webs to vegetation on land and keep the webs suspended above water. The spider itself is only a few inches long and eats insects such as bees and mayflies.

MOTHERS HELP SONS MATE

Male bonobos accompanied by their mothers have greater success mating with fertile females than unchaperoned males, say researchers from the Max Planck Institute in Germany. Mother bonobos can assist low- and mid-ranking sons (right: a mom grooms her son) by interrupting the mating attempts of unrelated males. By hanging out with mom, sons also have more opportunities to interact with fertile females, make their own overtures, mate and reproduce.

WHY FISH STOP AND GO

Small fish, especially young ones, tend to swim quickly for an instant, stop and then zip away again. What accounts for such darting around? Briefly stopping may allow small fish to better feel the pull of predators, such as larger fish, that suck prey into their mouths. Researchers at the University of California at Irvine found that stationary zebra fish larvae (left) in laboratory tanks are twice as likely as swimming ones to avoid piston-induced suction that mimics the water flow of a predator slurping up a meal.



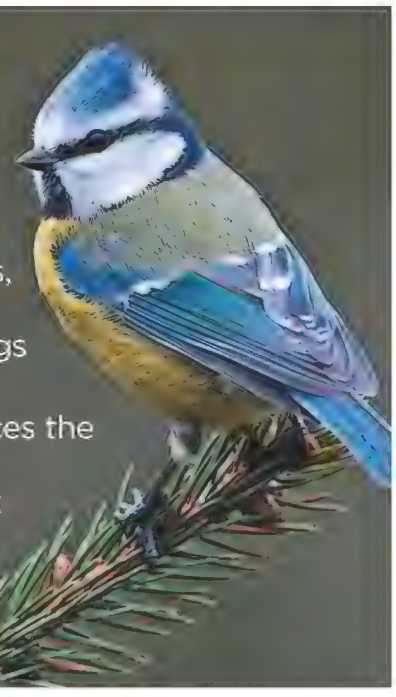
Observed

NAME: The blue tit, *Cyanistes caeruleus*, a European songbird.

AT FIRST LIGHT: Males sing at dawn.

BY NIGHT LIGHT: In areas with streetlights, males sing earlier in the morning and attract more mates, and females lay eggs 1.5 days sooner.

NOT SO BRIGHT: "Light pollution influences the timing of breeding behavior," says co-author Bart Kempenaers of the Max Planck Institute, and could override natural cues about when to mate and with whom.



KAZUO YAMAZAKI / JOURNAL OF INSECT SCIENCE; FRANS LANTING; MATTHEW HENRY; MATJAŽ KUNTER; ALAN WILLIAMS / NATUREPL.COM

For arthritis patients, it's simple physics:

A body in motion...tends to stay in motion.

Celebrex can help relieve arthritis pain...so you can keep moving.

It's simple physics — a body in motion tends to stay in motion. Staying active can actually relieve arthritis symptoms. But if you have arthritis, staying active can be difficult.

That's why you should talk with your doctor about treatment options, like prescription Celebrex.

- Just one 200mg Celebrex a day can provide 24-hour relief for many with arthritis pain and inflammation.* Relief that can help your body stay in motion.
- In clinical studies with osteoarthritis patients, Celebrex is proven to improve pain, stiffness and daily physical function.
- Celebrex is not a narcotic.

When it comes to relieving arthritis pain, you and your doctor need to balance the benefits with the risks — and find the right treatment for you.

So ask your doctor about Celebrex. It could be an important step towards keeping *your* body in motion.

Visit **celebrex.com**
or call 1-888-CELEBREX for more information.

You are encouraged to report negative side effects of prescription drugs to the FDA. Visit fda.gov/medwatch or call 1-800-FDA-1088.

*Individual results may vary.

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Important Safety Information:

Like all prescription NSAIDs, CELEBREX may increase the chance of heart attack or stroke that can lead to death. This chance increases if you have heart disease or risk factors for it, such as high blood pressure or when NSAIDs are taken for long periods.

CELEBREX should not be used right before or after certain heart surgeries.

Serious skin reactions, or stomach and intestine problems such as bleeding and ulcers, can occur without warning and may cause death. Patients taking aspirin and the elderly are at increased risk for stomach bleeding and ulcers.

Tell your doctor if you have: a history of ulcers or bleeding in the stomach or intestines; high blood pressure or heart failure; or kidney or liver problems.

CELEBREX should not be taken in late pregnancy.

Do not take CELEBREX if you've had an asthma attack, hives, or other allergic reactions to aspirin, any other NSAID medicine or certain drugs called sulfonamides.

Life threatening allergic reactions can occur with CELEBREX. Get help right away if you've had swelling of the face or throat or trouble breathing.

Prescription CELEBREX should be used exactly as prescribed at the lowest dose possible and for the shortest time needed.

See the Medication Guide on the next page for important information about Celebrex and other prescription NSAIDs.

CELEBREX®
(CELECOXIB CAPSULES) 100 mg 200 mg

For a body in motion

CELEBREX®
(celecoxib capsules)

Medication Guide
for Non-Steroidal Anti-Inflammatory Drugs (NSAIDs)
(See the end of this Medication Guide for a list of prescription NSAID medicines.)

What is the most important information I should know about medicines called Non-Steroidal Anti-Inflammatory Drugs (NSAIDs)?

NSAID medicines may increase the chance of a heart attack or stroke that can lead to death.
This chance increases:
- with longer use of NSAID medicines
- in people who have heart disease

NSAID medicines should never be used right before or after a heart surgery called a "coronary artery bypass graft (CABG)."
NSAID medicines can cause ulcers and bleeding in the stomach and intestines at any time during treatment. Ulcers and bleeding:
- can happen without warning symptoms
- may cause death

The chance of a person getting an ulcer or bleeding increases with:
- taking medicines called "corticosteroids" and "anticoagulants"
- longer use
- smoking
- drinking alcohol
- older age
- having poor health

NSAID medicines should only be used:
- exactly as prescribed
- at the lowest dose possible for your treatment
- for the shortest time needed

What are Non-Steroidal Anti-Inflammatory Drugs (NSAIDs)?
NSAID medicines are used to treat pain and redness, swelling, and heat (inflammation) from medical conditions such as:
- different types of arthritis
- menstrual cramps and other types of short-term pain

Who should not take a Non-Steroidal Anti-Inflammatory Drug (NSAID)?
Do not take an NSAID medicine:
- if you had an asthma attack, hives, or other allergic reaction with aspirin or any other NSAID medicine
- for pain right before or after heart bypass surgery

Tell your healthcare provider:
- about all of your medical conditions.
- about all of the medicines you take. NSAIDs and some other medicines can interact with each other and cause serious side effects. **Keep a list of your medicines to show to your healthcare provider and pharmacist.**
- if you are pregnant. **NSAID medicines should not be used by pregnant women late in their pregnancy.**
- if you are breastfeeding. **Talk to your doctor.**

What are the possible side effects of Non-Steroidal Anti-Inflammatory Drugs (NSAIDs)?

Serious side effects include:	**Other side effects include:**
• heart attack • stroke • high blood pressure • heart failure from body swelling (fluid retention) • kidney problems including kidney failure • bleeding and ulcers in the stomach and intestine • low red blood cells (anemia) • life-threatening skin reactions • life-threatening allergic reactions • liver problems including liver failure • asthma attacks in people who have asthma	• stomach pain • constipation • diarrhea • gas • heartburn • nausea • vomiting • dizziness

Get emergency help right away if you have any of the following symptoms:
- shortness of breath or trouble breathing
- chest pain
- weakness in one part or side of your body
- slurred speech
- swelling of the face or throat

Stop your NSAID medicine and call your healthcare provider right away if you have any of the following symptoms:
- nausea
- more tired or weaker than usual
- itching
- your skin or eyes look yellow
- stomach pain
- flu-like symptoms
- vomit blood
- there is blood in your bowel movement or it is black and sticky like tar
- skin rash or blisters with fever
- unusual weight gain
- swelling of the arms and legs, hands and feet

These are not all the side effects with NSAID medicines. Talk to your healthcare provider or pharmacist for more information about NSAID medicines.

Call your doctor for medical advice about side effects. You may report side effects to FDA at 1-800-FDA-1088.

Other information about Non-Steroidal Anti-Inflammatory Drugs (NSAIDs)
- Aspirin is an NSAID medicine but it does not increase the chance of a heart attack. Aspirin can cause bleeding in the brain, stomach, and intestines. Aspirin can also cause ulcers in the stomach and intestines.
- Some of these NSAID medicines are sold in lower doses without a prescription (over-the-counter). Talk to your healthcare provider before using over-the-counter NSAIDs for more than 10 days.

NSAID medicines that need a prescription

Generic Name	Tradename
Celecoxib	Celebrex
Diclofenac	Cataflam, Voltaren, Arthrotec (combined with misoprostol)
Diflunisal	Dolobid
Etodolac	Lodine, Lodine XL
Fenoprofen	Nalfon, Nalfon 200
Flurbiprofen	Ansaid
Ibuprofen	Motrin, Tab-Profen, Vicoprofen* (combined with hydrocodone), Combunox (combined with oxycodone)
Indomethacin	Indocin, Indocin SR, Indo-Lemmon, Indomethagan
Ketoprofen	Oruvail
Ketorolac	Toradol
Mefenamic Acid	Ponstel
Meloxicam	Mobic
Nabumetone	Relafen
Naproxen	Naprosyn, Anaprox, Anaprox DS, EC-Naproxyn, Naprelan, Naprapac (copackaged with lansoprazole)
Oxaprozin	Daypro
Piroxicam	Feldene
Sulindac	Clinoril
Tolmetin	Tolectin, Tolectin DS, Tolectin 600

*Vicoprofen contains the same dose of ibuprofen as over-the-counter (OTC) NSAIDs, and is usually used for less than 10 days to treat pain. The OTC NSAID label warns that long term continuous use may increase the risk of heart attack or stroke.

This Medication Guide has been approved by the U.S. Food and Drug Administration.

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MY KIND OF TOWN

PORTLAND, OREGON

Portland has a "goofy, energetic optimism," says novelist Katherine Dunn (on the city's Hawthorne Bridge).

Twice Charmed

The Pacific Northwest city captivated the author first when she was an adventure-seeking adolescent and again as an adult

BY KATHERINE DUNN PHOTOGRAPHS BY ROBBIE McCLARAN

PORTLAND AND I have both changed over the decades, but this city hooked me back when I was a book-drunk adolescent with a yen for stories and adventure. This is the town I ran away to, and half a century later that skewed fascination still shapes my perception of the place.

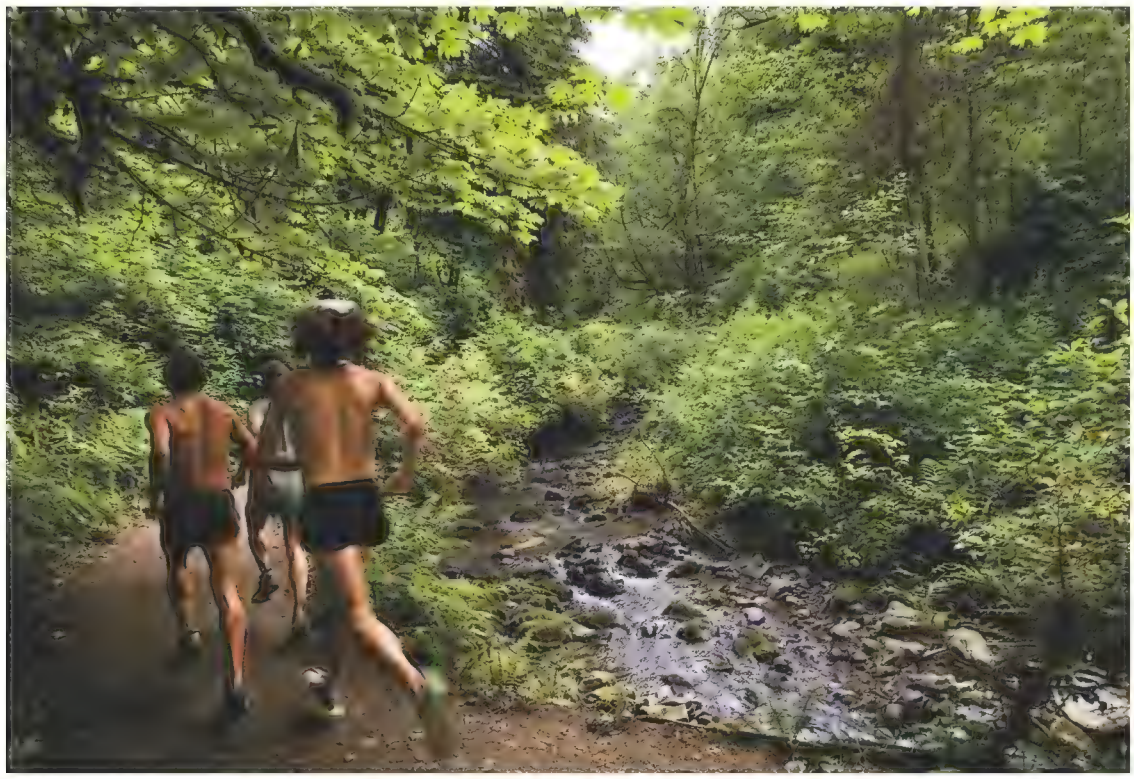
These days Portland is liberal and green. We have recycling, mass transit, bicycles, high-tech industries and so many creative types that the brewpubs and espresso shops have to work overtime to fuel them. It's still far from perfect. But despite the familiar urban problems, there's a goofy, energetic optimism afoot. A popular bumper sticker reads, "Keep Portland Weird," and a lot of us try to live up to it.

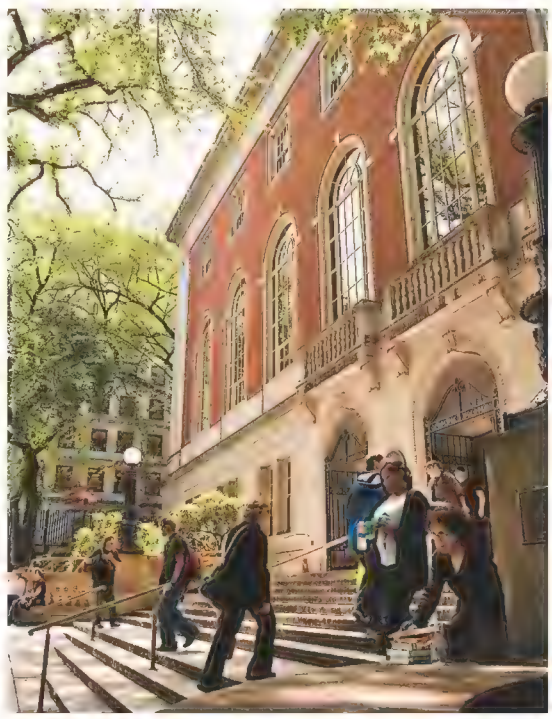
Back in the early 1960s I was going to high school in a pleasant two-stoplight village some 20 miles to the west. Portland, with its population of 370,000 people, was considered fearsome and wild. Folks from small towns and farms tend to see the only big town in the state as a paved jungle of noise, danger and depravity. That's what intrigued me.

Weekends and after school I'd hop the bus into town feeling jubilant and a tad scared. To my young eyes Portland was a tough blue-collar town, scarred by labor clashes and hard on minorities. Supported by timber and crops, built around the railhead and the river port, the city was still recovering from the Great Depression and the closing of its shipyards after World War II. Families were moving to the suburbs.

Downtown was the older, densely built west bank of the Willamette River. It climbed toward the high, forested ridge known as the West Hills, where the rich had built mansions with amazing views. The seedy section nearest the river was my early stomping ground. Taverns and strip joints were off limits at my age, but there were pawnshops, pool halls, tat-

I ran up four flights of stairs, opened the office door and found it empty.





Favorite haunts: The miles of trails meandering through the city's Forest Park (above) relieves Dunn's need for wilderness, while the historic Central Library (right), the loveliest building she'd ever entered in her youth, "still sets off a tuning fork" in her chest.

too parlors and palm readers. There were 24-hour diners and cluttered bookstores where you could hole up out of the rain and read while your sneakers dried.

I saw things, both sweet and grim, that I'd only read about. There were drunks passed out in doorways, but Romany (Gypsy) families dressed in gleaming satin picnicked in the park. I was lucky. People were kind or ignored me entirely.

A Chinese grocer suggested pork rinds as chumming bait, and I would dangle a hook and line off a storm drain near the flour mill. I watched gulls swoop around battered freighters loading cargo for the Pacific voyage, and I pulled heavy, metallic-gold carp out of the river. Mrs. M., a tarot and tea leaf specialist who lived and worked in a storefront near Burnside Street, bought them for a quarter each. She always wanted what she called "trash fish" to stew for her cats.

My first city job was trying to sell magazine subscriptions over the phone after school. Four of us blotchy teens worked in a cramped, airless room in the Romanesque Dekum Building on SW Third Avenue. Our spiels came from smeared mimeographs taped to the wall in front of us. The boss wore suspenders, Brylcreemed his hair and dropped in occasionally to deliver pep talks.

I didn't make a single sale the first week. But I was looking forward to a paycheck when I ran up four flights of stairs on Friday afternoon, opened the office door and found it empty. Stripped. No phones, desks or people. Just a torn copy of the sales pitch crumpled in a corner. This was a stunner, but given my allegiance to Raymond Chandler and the noir flavor of the Dekum in those days, it was fitting.

Other layers of the city gradually revealed themselves to me, and in retrospect it's clear that the seeds of today's Portland were well established even then. The big Central Library was the loveliest building I'd ever set foot in. I've seen the Parthenon and other wonders since, but that library, with its graceful central staircase, tall windows and taller ceilings, still sets off a tuning fork in my chest.

One summer I gave up shoes for philosophical reasons that escape me now, and went barefoot everywhere. I was exploring a student-infested neighborhood behind the Museum Art School and Portland State College. It had blocks of old workers' cottages with half-finished sculptures on sagging porches, drafting tables visible through front windows, and the sound of saxophones drifting through a screen door. I was busy soaking in this bohemian air when I stepped on a broken bottle and gashed my left big toe.

I limped along, rather proud of this heroic wound and its blood trail, until a curly-haired man called me up to his porch. He scolded me with neon-charged profanity while he cleaned and bandaged the cut. He said he wrote articles for newspapers and magazines. He was the first writer I'd ever met, so I told him I wanted to write, too. He snorted and said, "Take my advice, kid. Go home and run a nice hot bath, climb in and slit your wrists. It'll get you further." Many years later, we met again, and laughed about the encounter.

I went to college in Portland and met people from other places who saw the city with fresh eyes, calling attention to things I'd accepted without a thought.

"Rains a lot," some transplant might say.

Yes, it rains.

"Everything's so green. A lot of trees here."

Well sure, this is a rain forest.

"Drivers don't use their horns, here."

They do in an emergency.

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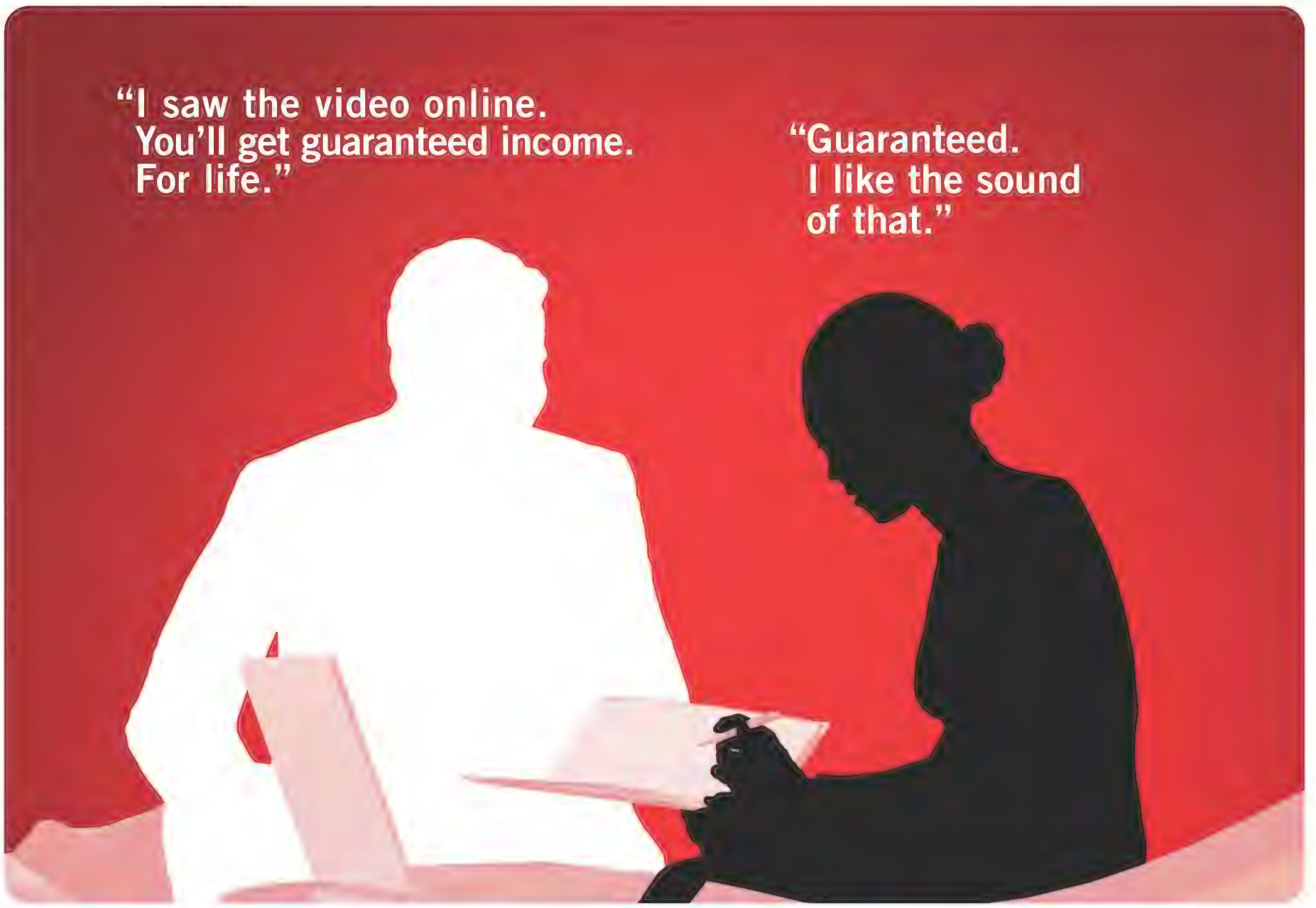

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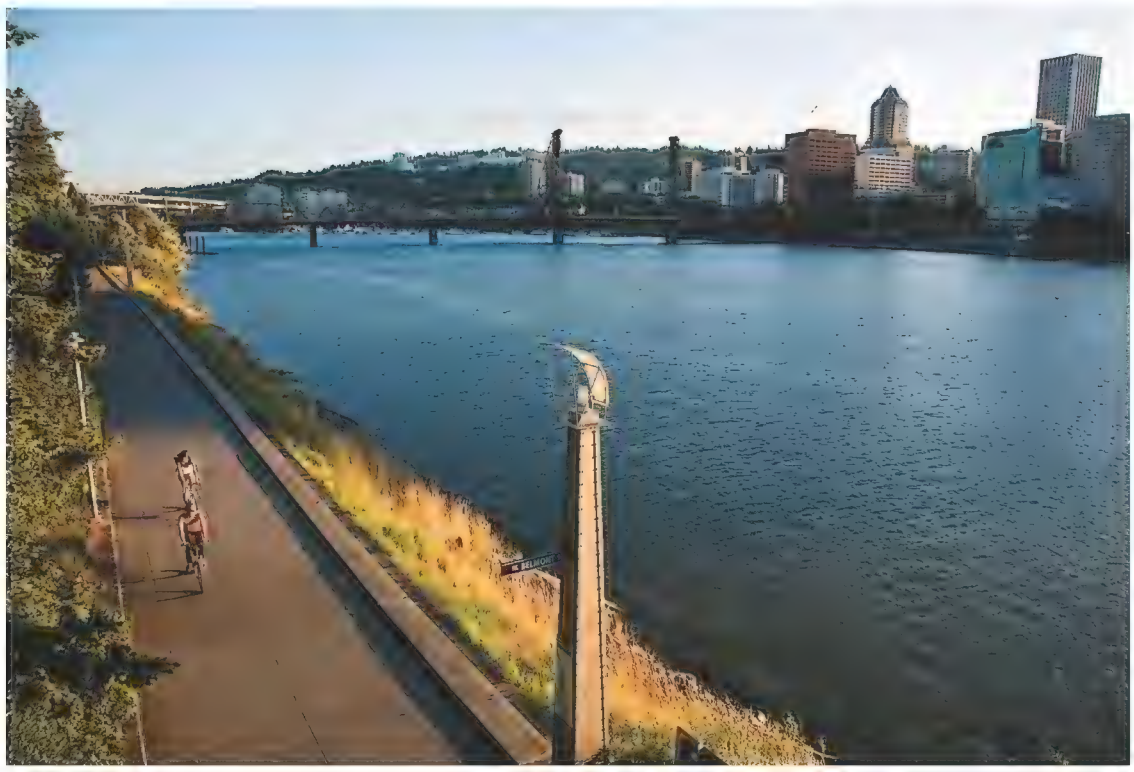
The bones of the place never change—the river, the hills, the rain.



"Sunlight comes in at a long angle," says Dunn, "touching everything with that golden Edward Hopper light" (above: the 1.5-mile-long Vera Katz Eastbank Esplanade). Portlanders love the sun and fill sidewalk café tables on warm nights (right: Por Qué No Taqueria).

"If one more store clerk tells me to have a nice day, I'll throttle him."

We're polite here. Just say "thanks," or "you too," and you're fine.

I'd focused on what made the city different from rural, small-town life. The newcomers reminded me that not all cities are alike. In 1967 I left Portland for other places, urban and rural, and on different continents. A decade passed and my son was ready to start school. I'd been missing the rain, and the Portland of my memory was an easy place to live, so we came back.

PORTLAND'S POPULATION has mushroomed since I was a kid. The perpetual tug of war between preserving and modernizing saws back and forth. Urban renewal ripped out communities and poured in glass, steel and concrete, but some of the replacements are wonderful. The town is better-humored now, more easygoing. That feel of the old hobnobbing with the new is more amiable. Of course the blood and bones of the place never change—the river, the hills, the trees and the rain.

Mount Hood still floats 50 miles to the east, a daytime moon, ghostly or sharp depending on the weather. It's been 200 years since Hood's last big eruption. But when Mount St. Helens blew her top in May of 1980, I walked two blocks up the hill from my house and got a clear view of it spewing its fiery innards into the sky. Volcanic ash fell like gray snow on Portland and took months to wash away.

People who come here from elsewhere bring good things with them. When I was young, exotic fare meant chop suey or pizza. Students from New York City begged their parents to ship frozen bagels out by air. Now restaurants offer cuisines from all over the world.

Many of my neighbors love being close to hiking and rafting, skiing and surfing. But the steep miles of trails through the trees and ferns and streams of the city's 5,000-acre Forest Park are wilderness enough for me. I love standing on the sidewalk and looking up at clouds wrapping the tall firs in a silver wash like a Japanese ink drawing.

The weather here is not out to kill you. Summers and winters are generally mild. Sunlight comes in at a long angle, touching everything with that golden Edward Hopper light. No one loves the sun more than Portlanders. Café tables spill onto the sidewalks and fill with loungers at the first glimpse of blue sky.

But the rain is soft, and I suspect it fosters creativity. Although Portland harbors doers and makers, inventors and scholars, athletes and brilliant gardeners, what touches me most is that this town has become a haven for artists of every discipline. They are reared here, or they come from far away for mysterious reasons. Their work makes life in Portland richer and more exciting. Several theater companies offer full seasons of plays. If you're not up for the opera, ballet or symphony, you can find stand-up comedy or dance and concert clubs in every musical genre. Animators and moviemakers burst out with festivals several times a year. Most surprising to me are the clothes designers who bring an annual fashion week to a town best known for plaid flannel and Birkenstocks.

Rain or shine, it's just a 15-minute stroll from my door to that beautiful library, and after all this time every step of the way has layers of history for me. The oddest thing is that I've grown old over the past half century while Portland seems brighter, more vital and younger than ever.

KATHERINE DUNN's *third novel,* Geek Love, *was a National Book Award finalist, and her most recent book,* One Ring Circus, *is a collection of her boxing essays.*

Read more contributions to My Kind of Town at Smithsonian.com/mykindoftown

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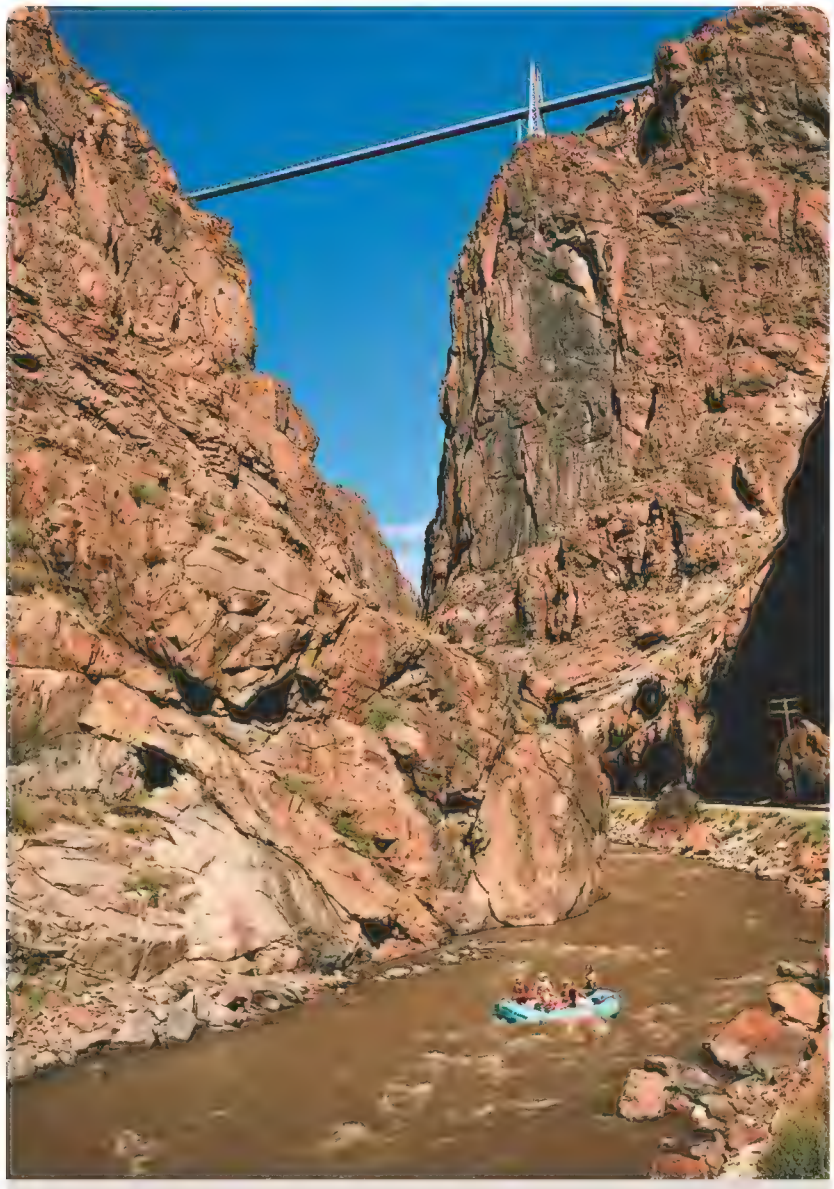


IN THE FOOTHILLS of the Rocky Mountains, Cañon City is a destination for laid-back families or avid outdoorsmen. The Royal Gorge Bridge is one of the highest suspension bridges in the world at 956 feet. There's also one of the steepest incline railways and a breathtaking tram ride over the gorge, not to mention a white-water kayaking or rafting course with Class 5 rapids. An easygoing, though still spectacular, two-hour train ride follows the Arkansas River under the bridge. Located just about in the middle of the state, Cañon City is something of a gateway to Wyoming to the north, Kansas to the east, Utah to the west and New Mexico to the south. Keeping its small-town atmosphere, it's populated by 25,000 residents and a stray dog here and there. I've been here for 34 years and can't imagine living anywhere else.

YOUR KIND OF TOWN

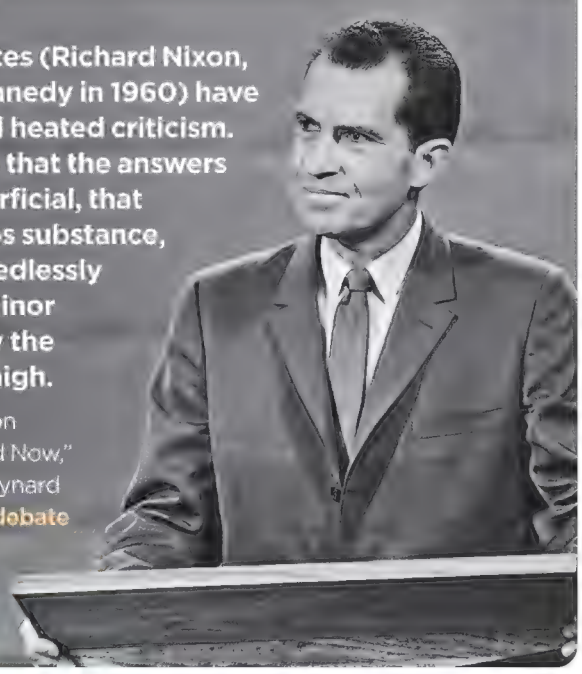
CAÑON CITY, COLORADO

BY ROBERT C. DELANEY

REALITY TV

Televised debates (Richard Nixon, facing John Kennedy in 1960) have always received heated criticism. Some complain that the answers tend to be superficial, that charisma trumps substance, that pundits needlessly obsess about minor goofs. Certainly the stakes are sky-high.

—From "Debating on Television: Then and Now," by W. Barksdale Maynard
Smithsonian.com/debate



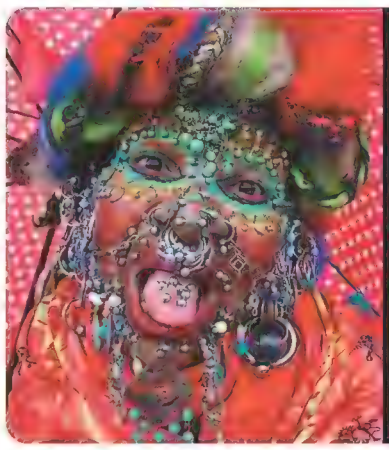


PHOTO CONTEST

"She said I could take a picture if I kissed her on the cheek, so I went for it!"

—**Allie Collopy** of Durham, N.H., on her 2010 photograph in London of Elaine Davidson, who says she has more body piercings than anyone

Enter your photograph at
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HOME IS WHERE THE ROAD IS

I sold my "sticks and bricks" 11 years ago and have been full-timing ever since. My current rig is a 31-foot Fourwinds trailer and a mint condition '82 diesel Suburban. There is no way I would go back to the "other world."

—**Paul Graham**, somewhere in the USA, on "Commemorating 100 Years of the RV"
Smithsonian.com/rv1

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THIS MONTH IN HISTORY

NOVEMBER ANNIVERSARIES
MOMENTOUS OR MERELY MEMORABLE

BY ALISON McLEAN

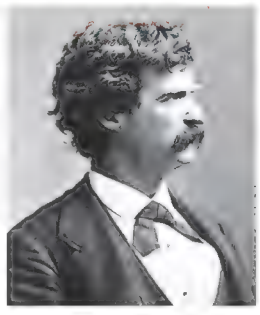
70 YEARS AGO
INCLINE AND FALL

Washington's four-month-old Tacoma Narrows Bridge collapses on November 7, 1940. Known as "Galloping Gertie" for its vertical ripple in a breeze, the span begins twisting laterally in the day's 42 mph winds. "I saw a side girder bulge out," says a witness. "Suddenly the bridge dropped from under me." A dog is the lone fatality. Study of the collapse—caught on film—improves bridge design.

390 YEARS AGO
SAFE HARBOR

Two months after leaving England, the 102 pilgrims of the *Mayflower,* foiled by bad weather in their attempt to reach their intended Hudson River destination, anchor at today's Cape Cod, November 11, 1620. "The whole country, full of woods and thickets, represented a wild and savage hue," colony leader William Bradford will later recall. To prevent dissenters from striking out on their own, the pilgrim men sign a compact creating a government in their new location. After a winter spent aboard ship, the 57 survivors head ashore to found a new English colony at Plymouth.

175 YEARS AGO MARK MY WORDS



Samuel Langhorne Clemens is born in Florida, Missouri, November 30, 1835. His father dies when he is 12, and Clemens finds work as a typesetter and apprentice riverboat pilot before beginning the writing career that makes him famous as Mark Twain, a pen name he adopts in 1863. As a journalist, and in more than 10 novels, including *Tom Sawyer* (1876) and *Huckleberry Finn* (1884), Twain infuses his work with an acerbic wit and his memories of life along the Mississippi. The uncensored version of his autobiography, embargoed for 100 years after his death in 1910, is published in 2010.

490 YEARS AGO SEA TO SHINING SEA

Portuguese explorer Ferdinand Magellan and his men become the first Europeans to sail from the Atlantic Ocean to the Pacific, November 28, 1520. Navigating a winding 350-mile-long strait between mainland South America and Tierra del Fuego takes Magellan 38 days; on emerging, he orders artillery fire and rejoicing. Magellan is killed before his crew finishes the first sail around the world, but his strait will remain a vital trade route until the Panama Canal opens in 1914.

120 YEARS AGO SERVICE REVELRY

A crowd of 500 gathers at the U.S. Military Academy at West Point as cadets face off against midshipmen from the U.S. Naval Academy, November 29, 1890, in the first Army-Navy football game. The contest is spearheaded by cadet Dennis Michie, a former high-school player who persuades West Point to field a team and challenge Navy. Navy triumphs, 24-0; Army wins a rematch in 1891. Though the teams will be eclipsed by other college rosters, the annual battle—set in 2010 for December 11—remains a fall classic.

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ARE YOU KIDDING YOURSELF?

A LOT OF PEOPLE THINK EXERCISE AND HEALTHY DIET ARE ENOUGH TO LOWER HIGH CHOLESTEROL. FOR 2 OUT OF 3, IT MAY NOT BE.

Did you know, more than 80% of people who have had heart attacks have high cholesterol? For 2 out of 3 people with high cholesterol, diet and exercise may not be enough. If you haven't been successful in trying to lower your cholesterol on your own, stop kidding yourself. Talk to your doctor about your risk and if Lipitor is right for you. You can also learn more at lipitor.com or call 1-888-LIPITOR.

- When healthy diet and exercise are not enough, adding Lipitor may help. Lipitor has been shown to lower bad cholesterol 39-60%. Average effect depending on dose.
- Along with diet, Lipitor is FDA-approved to reduce the risk of heart attack and stroke in patients who have heart disease or risk factors for heart disease. These risk factors include smoking, age, family history of early heart disease, high blood pressure and low good cholesterol.

Please see additional important information on next page.

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IMPORTANT SAFETY INFORMATION:
LIPITOR is not for everyone. It is not for those with liver problems. It is not for women who are nursing, pregnant or may become pregnant.

If you take LIPITOR, tell your doctor if you feel any new muscle pain or weakness. This could be a sign of rare but serious muscle side effects. Tell your doctor about all medications you take. This may help avoid serious drug interactions. Your doctor should do blood tests to check your liver function before and during treatment and may adjust your dose.

Common side effects are diarrhea, upset stomach, muscle and joint pain, and changes in some blood tests.

INDICATION:
LIPITOR is a prescription medicine that is used along with a low-fat diet. It lowers the LDL ("bad" cholesterol) and triglycerides in your blood. It can raise your HDL ("good" cholesterol) as well. LIPITOR can lower the risk for heart attack, stroke, certain types of heart surgery, and chest pain in patients who have heart disease or risk factors for heart disease such as age, smoking, high blood pressure, low HDL, or family history of early heart disease.

LIPITOR can lower the risk for heart attack or stroke in patients with diabetes and risk factors such as diabetic eye or kidney problems, smoking or high blood pressure.

You are encouraged to report negative side effects of prescription drugs to the FDA. Visit www.fda.gov/medwatch or call 1-800-FDA-1088.

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IMPORTANT FACTS

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LOWERING YOUR HIGH CHOLESTEROL

High cholesterol is more than just a number, it's a risk factor that should not be ignored. If your doctor said you have high cholesterol, you may be at an increased risk for heart attack and stroke. But the good news is, you can take steps to lower your cholesterol.

With the help of your doctor and a cholesterol-lowering medicine like LIPITOR, along with diet and exercise, you could be on your way to lowering your cholesterol.

Ready to start eating right and exercising more? Talk to your doctor and visit the American Heart Association at www.americanheart.org.

WHO IS LIPITOR FOR?

Who can take LIPITOR:

- People who cannot lower their cholesterol enough with diet and exercise
- Adults and children over 10

Who should NOT take LIPITOR:

- Women who are pregnant, may be pregnant, or may become pregnant. LIPITOR may harm your unborn baby. If you become pregnant, stop LIPITOR and call your doctor right away.
- Women who are breast-feeding. LIPITOR can pass into your breast milk and may harm your baby.
- People with liver problems
- People allergic to anything in LIPITOR

BEFORE YOU START LIPITOR

Tell your doctor:

- About all medications you take, including prescriptions, over-the-counter medications, vitamins, and herbal supplements
- If you have muscle aches or weakness
- If you drink more than 2 alcoholic drinks a day
- If you have diabetes or kidney problems
- If you have a thyroid problem

ABOUT LIPITOR

LIPITOR is a prescription medicine. Along with diet and exercise, it lowers "bad" cholesterol in your blood. It can also raise "good" cholesterol (HDL-C).

LIPITOR can lower the risk of heart attack, stroke, certain types of heart surgery, and chest pain in patients who have heart disease or risk factors for heart disease such as:

- age, smoking, high blood pressure, low HDL-C, family history of early heart disease

LIPITOR can lower the risk of heart attack or stroke in patients with diabetes and risk factors such as diabetic eye or kidney problems, smoking, or high blood pressure.

POSSIBLE SIDE EFFECTS OF LIPITOR

Serious side effects in a small number of people:

- **Muscle problems** that can lead to kidney problems, including kidney failure. Your chance for muscle problems is higher if you take certain other medicines with LIPITOR.
- **Liver problems**. Your doctor may do blood tests to check your liver before you start LIPITOR and while you are taking it.

Call your doctor right away if you have:

- Unexplained muscle weakness or pain, especially if you have a fever or feel very tired
- Allergic reactions including swelling of the face, lips, tongue, and/or throat that may cause difficulty in breathing or swallowing which may require treatment right away
- Nausea, vomiting, or stomach pain
- Brown or dark-colored urine
- Feeling more tired than usual
- Your skin and the whites of your eyes turn yellow
- Allergic skin reactions

Common side effects of LIPITOR are:

- Diarrhea
- Upset stomach
- Muscle and joint pain
- Changes in some blood tests

HOW TO TAKE LIPITOR

Do:

- Take LIPITOR as prescribed by your doctor.
- Try to eat heart-healthy foods while you take LIPITOR.
- Take LIPITOR at any time of day, with or without food.
- If you miss a dose, take it as soon as you remember. But if it has been more than 12 hours since your missed dose, wait. Take the next dose at your regular time.

Don't:

- Do not change or stop your dose before talking to your doctor.
- Do not start new medicines before talking to your doctor.
- Do not give your LIPITOR to other people. It may harm them even if your problems are the same.
- Do not break the tablet.

NEED MORE INFORMATION?

- Ask your doctor or health care provider.
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Around the Mall

SCENES AND SIGHTINGS FROM THE SMITHSONIAN MUSEUMS AND BEYOND

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CHIP CLARK / NMNH, SI

TRUE BLUE

SCIENTISTS AT THE NATURAL HISTORY MUSEUM SEARCH FOR THE ELUSIVE "RECIPE" THAT ENDOWS THE HOPE DIAMOND WITH ITS UNIQUE COLOR

PAGE 30

Big Opportunity

BY G. WAYNE CLOUGH

BIG BIRD and the other "Sesame Street" characters transformed learning for America's children, starting in 1969, as they demonstrated how effective television could be in teaching preschoolers basic skills. The creation of "Sesame Street" is Claudine Brown's favorite example of a "pivotal moment in history when technology and educational opportunities came together to make something amazing happen." Brown is the Smithsonian's new director of education, and she faces huge challenges: only 70 percent of U.S. students earn a high-school diploma, according to the Alliance for Excellent Education. Approximately 50 percent of African-American, Latino and Native American youths drop out of school prior to graduation. Internationally, U.S. students rank 25th in math and 21st in science.

The Smithsonian has been addressing these problems with technologies growing out of the digital revolution. Many of our most innovative programs engage youth audiences, including the Latino Virtual Museum, an online, 3-D learning environment in which users create an avatar and then explore the Smithsonian's vast collections and multidisciplinary research; the National Museum of Natural History's Encyclopedia of Life project; the Smithsonian Education Online Conferences; and the Cooper-Hewitt's "Design Your 'Hood," to name a few.

Big Bird: Standing, says Brown, at "a pivotal moment in history."

It is true that we need to do more to reach communities facing social and economic challenges, specifically underserved audiences in inner-city or rural areas. One-fifth of all public school students—ten million children—live in rural areas. In July, the Smithsonian co-hosted a National Rural Education Technology Summit. Federal Communications Commission Chairman Julius Genachowski told participants that "no technological innovation in our lifetime has greater potential to transform education than broadband Internet." The Smithsonian can play a pivotal role in realizing this potential by expanding our offerings of digitized collections, videos, simulations, games and research-based curriculum materials, and enhancing interactivity through our new Smithsonian Commons.

For two decades, the National Science Resources Center (NSRC)—administered jointly by the Smithsonian and the National Academies—has worked with many state and local jurisdictions to implement inquiry-oriented science programs for ten million children across the nation. In a recent competition that attracted 1,700 proposals, the U.S. Department of Education awarded $25.5 million to the NSRC. The grant supports a new initiative aimed at revitalizing science education for 75,000 students in Texas and North Carolina. It is difficult for a bird to applaud—no matter how large it is. But I'm sure that Big Bird is at least flapping his wings.

G. WAYNE CLOUGH *is Secretary of the Smithsonian Institution.*

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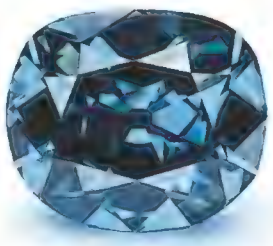
Night at the Museum

One summer evening, scientists raced against time to complete an experiment on the Hope Diamond

AT FIRST, Evalyn Walsh McLean, an heiress living in Washington, D.C., didn't want to buy the Hope Diamond. She was unhappy with the setting surrounding the precious blue stone that had once belonged to King Louis XIV and asked jeweler Pierre Cartier to create a new one: a circle of 16 clear diamonds, shaped like squares and pears.

That was in 1910, and for much of the past century the Hope Diamond remained in its Cartier setting. But several months ago, it was taken from the National Museum of Natural History's gem hall for an overnight stay in the mineralogy lab. There, geologists conducted an experiment to learn precisely why the Hope Diamond is so blue. Every gem has its own unique molecular formula, which is determined by how its atoms bond together in the extreme heat of the planet's crust. But the formula for deep ocean blue is rare, occurring in only one out of every several hundred thousand diamonds. At 45.52 carats, the Hope, discovered in 17th-century India, is the largest-known deep blue diamond. "Its creation, as far as we know, is a completely unique event in the history of the earth," says geologist Jeffrey Post, a curator at Natural History.

But before the experiment could begin, some delicate surgery had to be performed to remove the blue diamond from its setting. At 9:16 p.m in a room almost as long as a bus, where fluorescent lights and white walls canceled out even the sparkle of topaz on the shelves, jeweler Stephen Clarke donned a pair of glasses equipped with magnifying lenses and reached for his tools. He steadied the walnut-size gem in his left hand—his fingerprints smearing its 60 facets—while his right hand wielded a pair of tweezers. "It's like a little puzzle," Clark said, as he unhooked the small wire rivets holding the diamond in place.

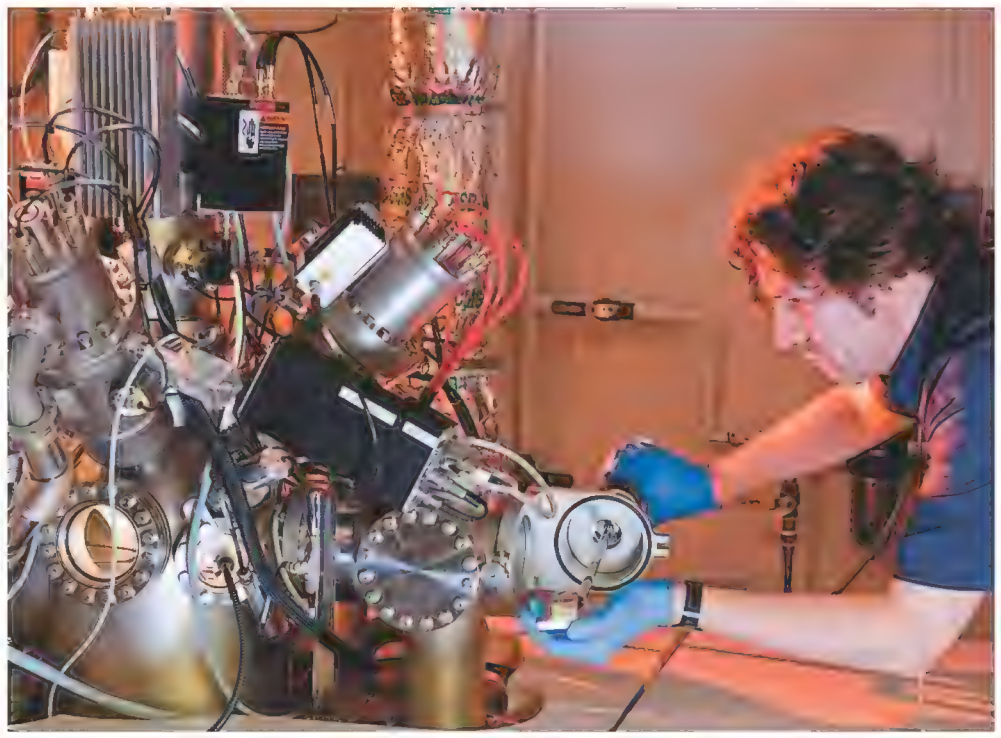


A security officer peeked into the room. "Look at that," he said. "It's even more beautiful out of the setting than in."

At 12:35 a.m., two researchers wearing blue gloves cleaned the stone of the jeweler's prints. Carefully, they loaded it into a custom-made mount and placed it into the chamber of a device that would fire an ion beam, boring a ten-angstrom-deep hole (just over four-billionths of an inch) into the gem.

"Looks more like a science experiment than a fancy gemstone right now, doesn't it?" Post said to a film crew from the Smithsonian Channel, which will air a documentary on the Hope Diamond on November 21.

It would be another hour before the experiment could begin, since all the air first had to be pumped out of the chamber to create a vacuum. The scientists rested their eyes. "This is our one shot," Post said. "We'll take measurements until they tell us the diamond has to be put back on display."



Researcher Detlef Rost (above) loads the Hope Diamond (below: actual size) into a device that will drill a small hole in it, scattering the gem's atoms into a chamber to be measured and analyzed.

While the precise recipe for the Hope is a mystery, geologists know that the primary ingredient endowing the diamond with its color is the element boron. The night's research may someday be applied to making synthetic blue diamonds—not only for jewelry, but for electronics. Boron allows current to pass through the stones more efficiently than your average semiconductor. "It's not clear yet how we're going to be able to make these things," Post said, "but the experiment gives us a way of seeing how nature did it."

At 2:35 a.m., with the click of a computer mouse, the ion beam fired. Millions of Hope Diamond atoms sputtered into the vacuum. They were sucked into a tube, past a detector that analyzed the elements.

The initial results came in. Colored spikes appeared on a computer screen, announcing the presence of boron, carbon, hydrogen and possibly some nitrogen. Based on the findings so far, the concentration of boron varies within the diamond, ranging from zero to eight parts per million. The Hope is actually a mosaic of blues.

It will be months before the scientists publish the full results of their experiment. In the meantime, the Hope is back in its display case and—unknown to most museum visitors—a few million atoms lighter.

JOSEPH CAPUTO

CHIP CLARK / NMNH, SI (2)

Learn more about the Hope Diamond at Smithsonian.com/hopediamond

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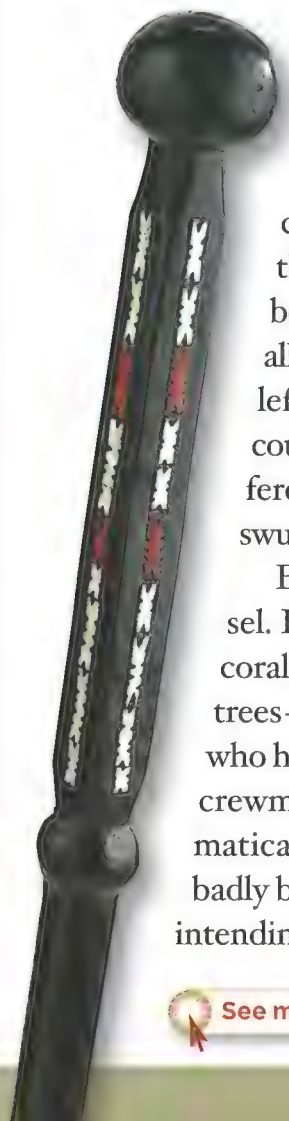
Pacific Theater

A carved walking stick evokes PT-109 commander John F. Kennedy's dramatic rescue at sea **BY OWEN EDWARDS**

JOHN F. KENNEDY—elected 50 years ago this month—may not have been the most photographed of America's presidents, but, like Abraham Lincoln, the camera loved him. His enviable thatch of hair and wide smile, plus his chic wife and two adorable children, turned serious photojournalists into dazzled *paparazzi*.

One of the most compelling Kennedy portraits shows him as a young naval officer, leaning on a cane, his smile giving no indication that he was recovering from serious injuries incurred during a near-fatal ordeal at sea. The fellow officer who took that picture, Ted Robinson, recently donated a rare original print of the image—as well as the ironwood cane he lent the future president during his recovery in the Solomon Islands—to the National Museum of American History.

According to the official Navy report, written shortly after the event by Lt. j.g. Byron White (the future Supreme Court justice), 14 PT boats—three-engine wooden vessels armed with two .50-caliber machine guns and torpedoes—left their Rendova Island base at 6:30 p.m. on August 1, 1943, with the mission of intercepting Japanese ships in the Blackett Strait. The group divided into four squadrons, with PT-109 patrolling near Makuti Island.



One of the boat's men, Ensign George Ross, was on lookout when, around 2:30 a.m., a Japanese destroyer suddenly loomed off the starboard bow, rammed the 109 and cut it in half. Spilled fuel ignited on the water, causing crews of the other PT boats to assume there had been no survivors. Two crew members were never seen again, but 11 who survived, all wearing life vests, managed to board what was left of PT-109. One had been badly burned and couldn't swim. Lieutenant Kennedy, who had suffered a ruptured spinal disk in the collision, had swum and towed him to the boat.

By dawn, the men abandoned the sinking vessel. Kennedy decided that they should swim to a coral island—100 yards in diameter with six palm trees—three and a half miles away. Again, Kennedy, who had been on the Harvard swim team, towed his crewmate the whole way. The report states undramatically: "At 1400 [2 p.m.] Lt. Kennedy took the badly burned McMahon in tow and set out for land, intending to lead the way and scout the island."

See more Kennedy pieces at Smithsonian.com/jfk

For the next two nights, Kennedy—sometimes with Ross, sometimes alone—swam from the island into the strait with a waterproof flashlight, hoping to intercept a U.S. torpedo boat. Battling injuries, exhaustion and strong currents, he saw no patrols. On August 5, Kennedy and Ross swam to a neighboring island and found a canoe, a box of Japanese rice crackers and fresh water. They also saw two islanders paddling away in a canoe. When they returned to the island where the crew waited, they discovered that the two natives had landed and were gathering coconuts for the crew. On display at the Kennedy Library in Boston is the coconut shell on which Kennedy scratched a message: "Nauru Isl commander / native

Kennedy (with cane in the Pacific, 1943) would later downplay his PT-109 role: "It was involuntary," he quipped. "They sank my boat."

TED ROBINSON; CANE: HUGH TALMAN / DIVISION OF POLITICAL HISTORY / NMAH, SI (DONATED BY THEODORE M. ROBINSON)

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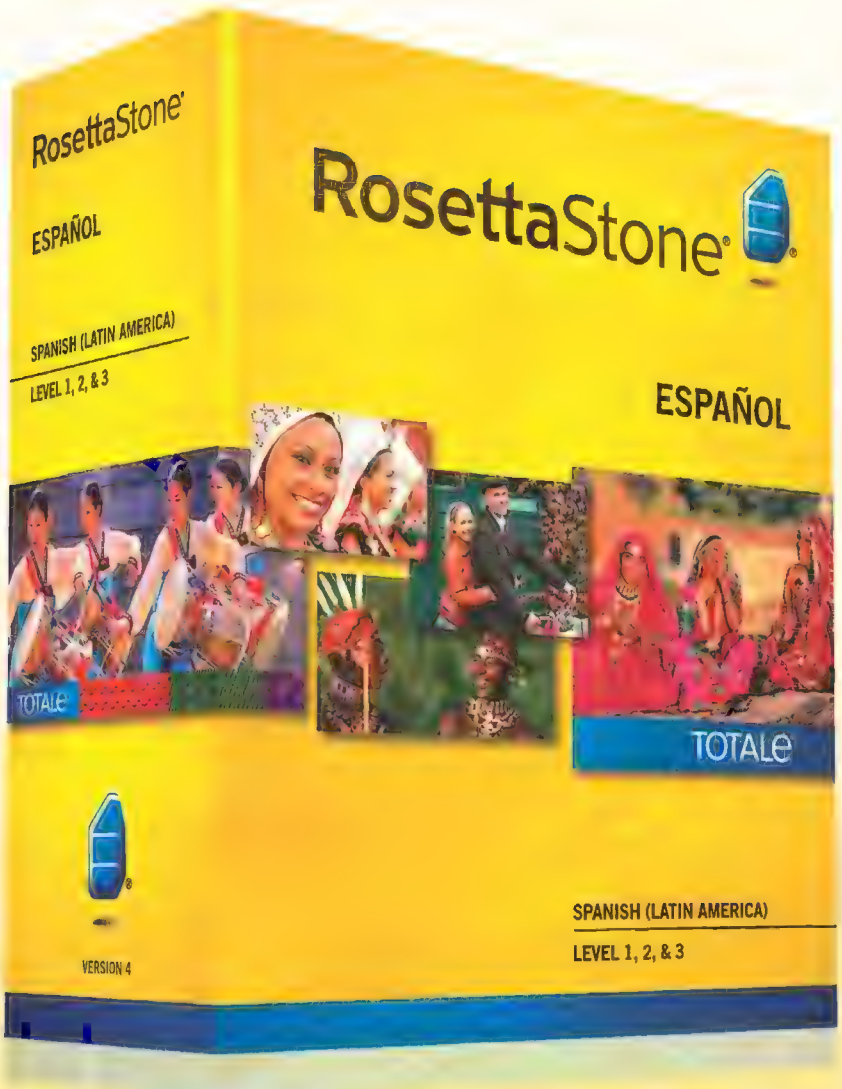

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Q&A

In recognition of his widely hailed emergency landing on the Hudson River on January 15, 2009, **CAPT. CHESLEY "SULLY" SULLENBERGER** and the crew of US Airways Flight 1549 were awarded the National Air and Space Museum's highest honor: the 2010 Current Achievement Trophy. He spoke with the magazine's Megan Gambino.

What can other pilots learn from your experience?

One of the things I encourage other pilots to think about is that—out of a 43-year career—my entire life is being judged on the basis of those 3 minutes and 28 seconds. We never know which flight will test us. So it's incumbent on each of us to be vigilant and avoid complacency. I had gotten to a point late in my career when I thought that test would never happen to me. I was wrong.

"I thought that test would never come."

What is your definition of a hero?

My wife actually looked it up in the dictionary. We decided between ourselves that it describes someone who chooses to put himself at risk to save another. That didn't quite fit my situation, which was thrust upon me suddenly. Certainly, my crew and I were up to the task. But I'm not sure it quite crosses the threshold of heroism. I think the idea of a hero is important. But sometimes in our culture we overuse the word, and by overusing it we diminish it.

In general, do you think the public takes for granted the challenges confronting airline pilots?

We have gotten so used to the convenience and safety of flying that we tend to overlook two things. First, flying is a relatively new human endeavor. Second, people forget that what we're really doing, ultimately, is pushing an aluminum or a composite tube through the upper reaches of the troposphere or the lower regions of the stratosphere at 80 percent of the speed of sound in a hostile environment—and we must return it safely to the surface every single time. If it were easy, anybody—everybody—could do it.

What has been your most unexpected insight?

One of the biggest surprises is that unlike so many stories that fade with the end of the news cycle this one simply hasn't. I guess the lesson learned is about the power of certain events to touch and inspire.

Read more of our interview with Captain Sullenberger at Smithsonian.com/sully

knows posit / he can pilot / 11 alive need small boat / Kennedy."

Kennedy asked the islanders to take the coconut to the base at Rendova. The next day, eight natives appeared on Kennedy's island with a message from an Australian coast watcher—a lookout posted on another island—to whom they'd shown the coconut. The islanders took Kennedy by canoe to the scout, Reginald Evans, who radioed Rendova. Again, in the measured words of Byron White: "There it was arranged that PT boats would rendezvous with [Kennedy] in Ferguson Passage that evening at 2230 [10:30]. Accordingly, he was taken to the rendezvous point and finally managed to make contact with the PTs at 2315 [11:15]. He climbed aboard the PT and directed it to the rest of the survivors." The boat Kennedy climbed aboard was PT-157: Ensign Ted Robinson was in the crew.

Robinson, now 91 and living in Sacramento, California, recalls that he and Kennedy were later tentmates in the Solomons. "His feet were still in bad shape," Robinson says. "So I loaned him a cane I'd received from a village chief and took his picture."

Not long after, Robinson adds, Marines were trapped during a raid on Japanese-held Choiseul Island. "They landed on the enemy island in the middle of the night," he says. "Their commanding officer radioed the next morning that he and his men were surrounded and heavily engaged. The CO who received the message said he'd get them out after dark." According to Robinson, the Marine responded, "If you can't come before then, don't bother coming."

The CO asked for a volunteer to make a daylight dash to save the Marines. "I wasn't there," Robinson told me, "but if I'd been, I'd have hidden behind the biggest palm tree I could find." But Kennedy volunteered. "With a full load of fuel that would get him there and halfway back to where he could be towed home," Robinson says, "he took off and got the Marines out."

OWEN EDWARDS *is a freelance writer and author of the book* Elegant Solutions.

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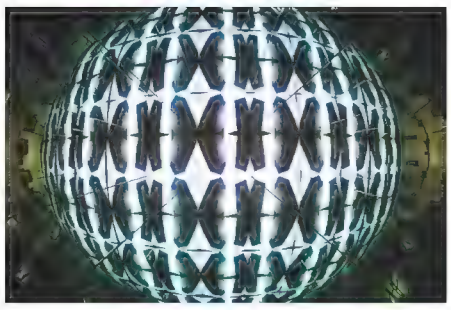
What's Up



MIRROR, MIRROR

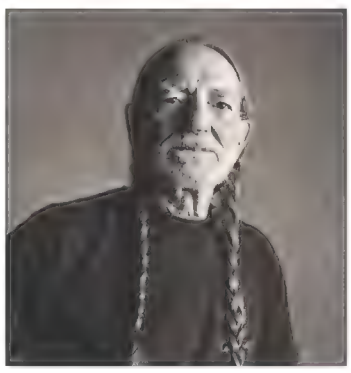
Theo Eshetu's *Brave New World II* (left), a kaleidoscopic video installation in a mirrored box, uses images from around the world to remind us that culture knows no borders. See the work now on permanent display at African Art.

EPIC SCENES

At the Sackler Gallery through April 17, 2011, a collection of pieces illustrates the Iranian epic poem *Shahnama*—a history of Persia from its creation through the Arab conquest (left: bronze plate, Sasanian period, seventh century).

BEST AND BRIGHTEST

Both famous and obscure people who have made outstanding contributions to society share equal billing at "Americans Now," on display at the National Portrait Gallery through July 10, 2011 (right: *Willie Nelson*, 1999).

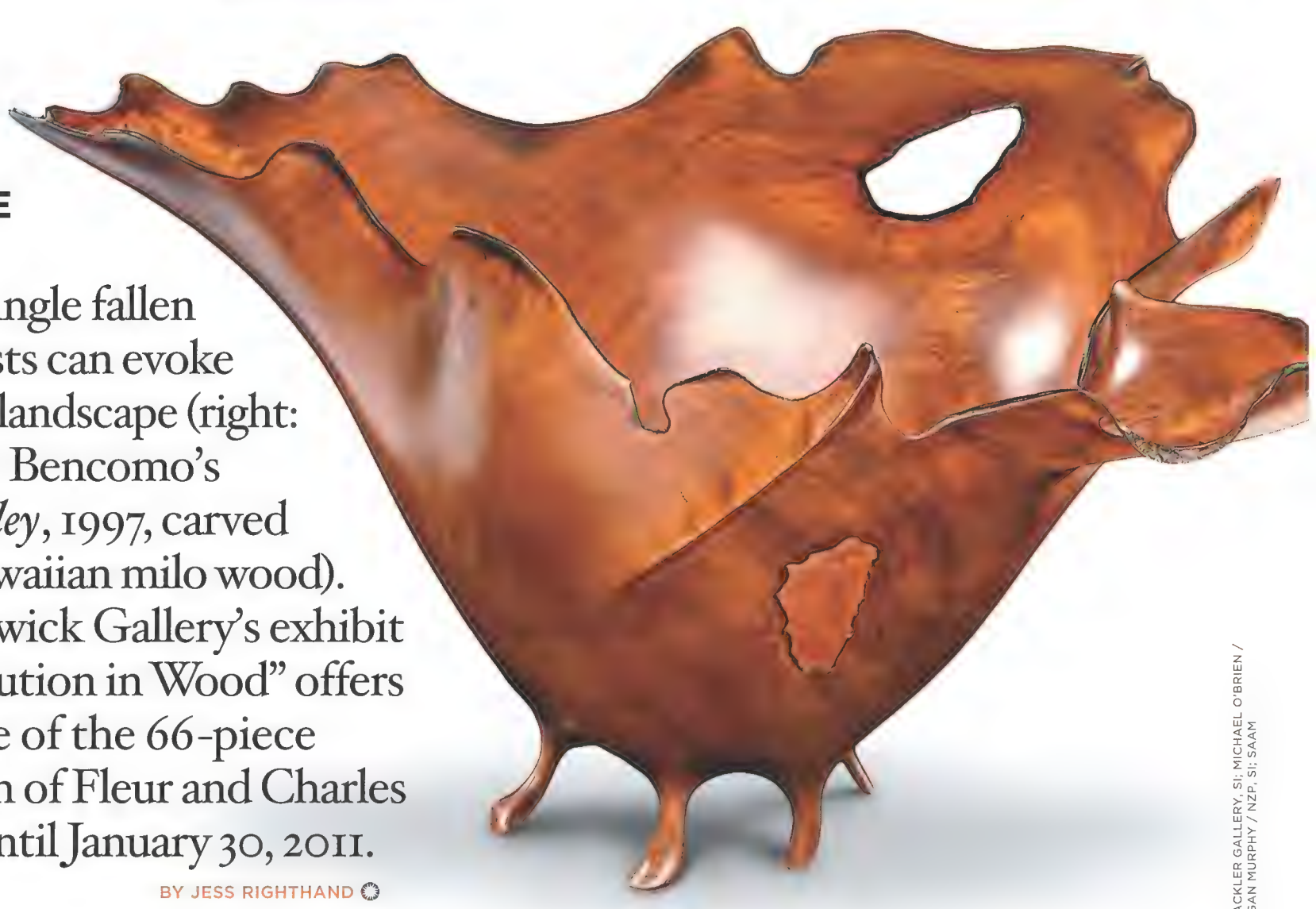


PRIDE OF THE ZOO

This past fall, lion sisters Shera and Nababiep each gave birth to a litter of healthy cubs, yielding a total of seven new additions to the National Zoo (right: Shera's cubs, at their first medical exam).

INTO THE WOODS

Using a single fallen tree, artists can evoke an entire landscape (right: Derek A. Bencomo's *Hana Valley*, 1997, carved from Hawaiian milo wood). The Renwick Gallery's exhibit "A Revolution in Wood" offers a glimpse of the 66-piece collection of Fleur and Charles Bresler until January 30, 2011.



BY JESS RIGHTHAND

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RESURRECTING THE CZAR

The recent discovery of the remains of two missing Romanovs has pitted the Russian Orthodox Church against forensic science

BY JOSHUA HAMMER PHOTOGRAPHS BY KATE BROOKS

Valentin Gribenyuk trudges ahead of me through a birch and pine forest outside Yekaterinburg, Russia, waving oversize mosquitoes from his neck and face. The woods close in around us as we follow a trail, stepping over rotting tree trunks and dark puddles. "Right here is the Old Koptyaki Road," he says, pointing to a dirt and gravel path next to a gas pipeline. "This is where the assassins drove their truck." We stop at a spot where nine timbers are embedded in the ground. A simple wooden cross stands vigil. "The bodies were found buried right [at the site marked by] these planks."

Like many Russians, Gribenyuk, a 64-year-old geologist, has long been obsessed with one of Russia's most infamous crimes. He now finds himself at the center of the latest controversy surrounding the grisly, world-shattering events of July 17, 1918.

Around 2 a.m. on that day, in the basement of a commandeered house in Yekaterinburg, a Bolshevik firing squad executed Czar Nicholas II, his wife, Alexandra, the couple's five children and four attendants. The atrocity ended imperial rule in Russia and was the signature act of a new Communist regime that would brutalize its citizens for most of the 20th century.

The murder of Czar Nicholas Romanov and his family has resonated through Soviet and Russian history, inspiring not only immeasurable government coverups and public speculation but also a great many books, television series, movies, novels and rumors. Yet if it has been an open secret that the Communists had dispatched the Romanovs, there was genuine mystery, apparently even within the government, concerning the whereabouts of the royal remains.

Then, in May 1979, a handful of scientists searching clandestinely in the woods outside Yekaterinburg, a city of 1.5 million residents 900 miles east of Moscow in the Ural Mountains, found the long-decayed skeletons of nine people, including three children. But the scientists didn't divulge their secret until 1990, as the USSR teetered toward collapse. As it happened, a powerful new forensic identification method based on DNA analysis was just coming into its own, and it soon showed that the remains of five of the nine persons uncovered were almost certainly those of the czar, his wife and three of their children; the others were the four attendants.

The story, of course, has been widely reported and celebrated as a sign of post-Soviet openness and as a triumph of forensic science. It's also common knowledge that

Many Russians regard the Romanovs, canonized by the Orthodox Church in 2000, as martyrs (a monarchist displays their images). The czar symbolizes "what happened to Russia—the lost chance for greatness," says a clergyman.

the Russian Orthodox Church and some prominent Romanov descendants dispute those findings. The church and the royals—both of which were suppressed by the Soviets—are longtime allies; the church, which regarded the czar as a near-divine figure, canonized the family in 2000, and a movement to reinstate the monarchy, though still small, does have its passionate adherents. Ironically, both the church and some in the royal family endorse an older, Soviet recounting of events that holds that the Romanov remains were disposed of elsewhere in the same forest and destroyed beyond recovery. The 1990 forensic findings, they contend, were flawed.

But that became harder to accept after a July day in 2007.

That's when a team of investigators working with Gribenyuk uncovered the remains of two other Romanovs.

NICOLAY ALEXANDROVICH ROMANOV was born near St. Petersburg in 1868, the son of Crown Prince Alexander and Maria Feodorovna, born Princess Dagmar of Denmark. His father ascended the throne as Alexander III in 1881. That year, when Nicolay was 13, he witnessed the assassination of his grandfather, Alexander II, by a bomb-throwing revolutionary in St. Petersburg. In 1894, as crown prince, he married Princess Alix of Hesse, a grand duchy of Germany, granddaughter of Queen Victoria. Nicholas became czar the same year, when his father died of kidney disease at age 49.

Nicholas II, emperor and autocrat of all the Russias, as he was formally known, reigned uneventfully for a decade. But in 1905, government troops fired on workers marching toward St. Petersburg's Winter Palace in protest against poor working conditions. About 90 people were killed and hundreds wounded that day, remembered as "Bloody Sunday." Nicholas didn't order the killings—he was in the countryside when they took place—and he expressed sorrow for them in letters to his relatives. But the workers' leader denounced him as "the soul murderer of the Russian people," and he was condemned in the British Parliament as a "blood-stained creature."

He never fully recovered his authority. In August 1914, following the assassination of Austria's Archduke Franz Ferdinand, Nicholas plunged the unprepared nation into World War I. Supply lines collapsed; food shortages and unrest spread through Russia. Hundreds of thousands died in trenches under withering artillery and machine-gun fire by the German and Austro-Hungarian armies. On March 12, 1917, soldiers in St. Petersburg mutinied and began seizing imperial property. Three days later, facing the Russian Parliament's demand that he quit, and fearing an outbreak of civil war, Nicholas abdicated the throne. He was evacuated to the Ural Mountains, where the family was put under house arrest.

The American journalist and historian Robert K. Massie, author of the best-selling biography *Nicholas and Alexandra*, described the czar as an inept ruler "in the wrong place in history." But Massie also took note of Nicholas' "personal charm, gentleness, love of family, deep religious faith and strong Russian patriotism."

The Bolsheviks, a faction of Marxist revolutionaries led by Vladimir Lenin, seized power that October and moved the family to a two-story house in Yekaterinburg owned by a military engineer, Nikolai Ipatiev. Nine months later, the Romanovs were awakened in the middle of the night, told of advancing White Russians—counterrevolutionary forces, including remnants of the czarist army—and led into the basement. A ten-man execution squad entered the room. Their leader, Yakov Yurovsky, pronounced a death sentence. Nicholas uttered his last words—"What?" or "You know not what you do" (accounts differ)—and the squad opened fire. The shots instantly killed the czar, but some bullets failed to penetrate his daughters' jewel-encrusted corsets. The young women were dispatched with bayonets and pistols.

State radio announced only that "Bloody Nicholas" had been executed. But rumors that the entire family had been murdered swirled. One week after the killings, the White Russian Army drove the Bolsheviks out of Yekaterinburg. (It would hold the city for about a year.) The White Russian commander appointed a judicial investigator, Nikolai Sokolov, to look into the killings. Witnesses led him to an abandoned iron mine at Ganina Yama, about ten miles outside town, where, they said, Yurovsky and his men had dumped the stripped bodies and burned them to ashes. Sokolov searched the grounds and climbed down the mine shaft, finding topaz jewels, scraps of clothing, bone fragments he assumed were

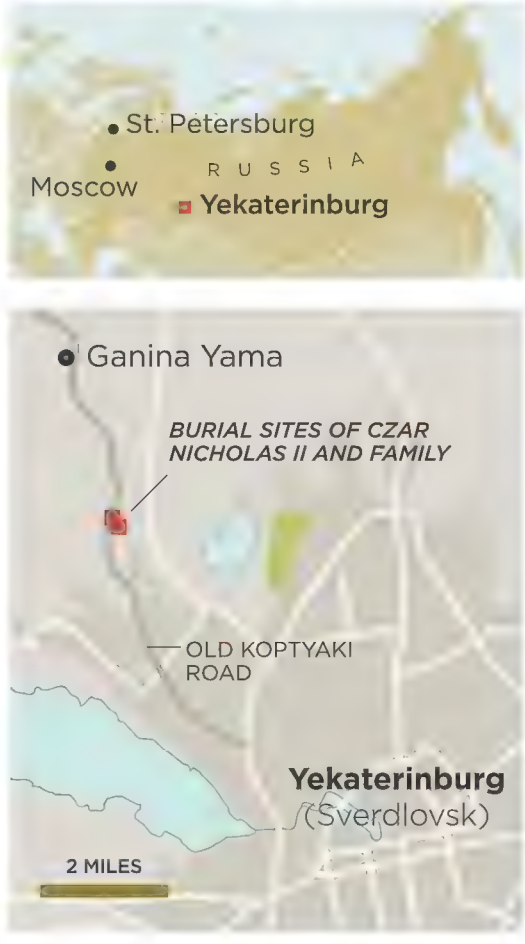
JOSHUA HAMMER, *who wrote about Sicily's Mafia in the October issue, lives in Berlin. Photographer* **KATE BROOKS** *is Istanbul based.*

In July 2007, a team working with Valentin Gribenyuk (left: at the Yekaterinburg burial site) made a stunning discovery when they uncovered remains later determined to be those of the czar's son, Alexei, and daughter Maria (below: planks mark the location where a grave containing the czar and the other family members was found in 1979). The church refuses to accept any of the identifications, insisting that the bodies were incinerated at nearby Ganina Yama (map). Tamara Tsitovich, an investigator who helped authenticate the remains of Alexei and Maria, validates Gribenyuk's find: "The bodies have been identified."

the Romanovs' (others have since concluded they were animal bones) and a dead dog that had belonged to Nicholas' youngest daughter, Anastasia.

Sokolov boxed his evidence and took it to Venice, Italy, in 1919, where he tried to present it to Grand Duke Nikolai Nikolaevich, the czar's uncle; the duke refused to show the items to the czar's exiled mother, Maria Feodorovna, fearing they would shock her. To the end of her life in 1928, she would insist that her son and his family were still alive somewhere. Officials of the Russian Orthodox Church, also in exile, embraced the investigator's account, including the conclusion that the bodies had been burned at Ganina Yama.

Legend had it that Sokolov's evidence ended up hidden inside a wall at the New Martyrs Russian Orthodox Church in Brussels. But Vladimir Solovyev, a criminal investigator in the Moscow prosecutor's office who has worked on the Romanov case since 1991, searched the church and turned up nothing. The evidence, he said, "vanished during the Second World War."



MAP: GUILBERT GATES

YEKATERINBURG IS A SPRAWLING industrial city on the banks of the Iset River. Known as Sverdlovsk during Soviet times, Yekaterinburg, like much of Russia, is marked by its Communist past: on Lenin Street, a huge bronze statue of the Bolshevik revolutionary, his arm outstretched, leans toward City Hall, a Stalin-era structure covered with friezes of Soviet workers and soldiers. Inside a crumbling building near the city center, I climbed a stairwell redolent of boiled cabbage to a top-floor apartment, where I met Alexander Avdonin, a geologist who uncovered the truth about the Romanov remains—then kept it secret for a decade.

Avdonin, white-haired and ailing at 78, grew up in Yekaterinburg, not far from the Ipatiev house, where the executions occurred. From the time he was a teenager, he says, he was intrigued by what happened that notorious night. There were, to be sure, many different accounts, but in the one that would eventually pay off for Avdonin, the Bolshevik leader Yurovsky indeed piled the Romanov corpses into a truck and drove to the Ganina Yama mine. But Yurovsky decided that too many people had witnessed the movements of trucks and soldiers during the night. So he later returned to the mine, put the bodies back in a truck and headed for some other iron mines 25 miles away. Five minutes down

the road, the vehicle got stuck in mud. It was here, a few miles from Ganina Yama, witnesses said, that Yurovsky and his men hurriedly doused some of the bodies with sulfuric acid and gasoline and burned them. According to Moscow investigator Solovyev, nine bodies were placed beneath some logs and two others in a separate grave. Yurovsky apparently believed that separating family members would help obscure their identities.

"The decision was meant to be temporary, but the White Army was approaching, so that grave would be the final grave," Solovyev told me.

But where, exactly, was that final site? In 1948, Avdonin got his hands on a diary written by a local Bolshevik official, Pavel Bykov; it had been published in 1926 under the title *The Last Days of Czardom*. The book—the first public admission by the regime that the entire Romanov family had been executed—suggested that the bodies hadn't been burned to ash, but rather buried in the forest. By the 1940s, *The Last Days* had vanished from libraries, presumably confiscated by Soviet authorities, but a few copies survived. Avdonin also read an account by the Russian poet Vladimir Mayakovsky, who said that, in the late 1920s, he had been taken to the burial site—"nine kilometers down the Old Koptyaki Road" from the center of town. Finally, Avdonin came across an account published by Sokolov, the original investigator. It contained a photograph of timbers—likely railroad ties—laid down in the forest; Sokolov described the site marked by the boards as a place where some unidentified corpses had been dumped. "Sokolov interviewed a railroad worker [who] said that a vehicle with corpses in it got stuck in a bog," Avdonin said. "This worker said that the vehicle, horses and two dozen men spent all night in the forest."

In the spring of 1979, Avdonin told me, he and several fellow geologists, hoping to locate the remains, obtained permits to conduct scientific research in the area. The ruse worked, and they quickly came across a place marked by planks laid in the earth. "There was nobody else around," he told me. "We took shovels and we started digging."

Avdonin spied the first bones—"three skulls, with bullet holes. We took them out of the soil. And we covered the place where we were digging, to leave no traces."

Avdonin said he kept the skulls while he tried to find someone who could conduct forensic tests on them. After a year without success, he said, "we put the skulls back in the grave, because it was too dangerous to keep them." Had he and the other men been discovered, "we could have easily been put in prison, or just disappeared."

The men vowed to keep their findings secret, and they did so for ten years. But in 1990, in the last days of the Soviet regime, Avdonin wrote to Boris Yeltsin, at the time the chairman of the Supreme Council of Russia. While serving as Communist Party boss in Sverdlovsk in 1977, Yeltsin had

PP. 42-43 BETTMANN / CORBIS

REUTERS / CORBIS; U.S. DEPARTMENT OF DEFENSE; FRED W. BAKER III / U.S. DEPARTMENT OF DEFENSE; MICHAEL D. COBLE

carried out a Politburo order to destroy the Ipatiev house. (A Russian Orthodox church has recently gone up on the site.) But since then Yeltsin had morphed into a democrat, and Avdonin now felt he could trust him. "I told him where the remains lay," Avdonin told me. "And I asked him to help me bring them back to history." Yeltsin wrote back, and the next year, investigators from the Sverdlovsk region's prosecutor's office, using Avdonin's information, exhumed nine skeletons from a single, shallow grave.

The whereabouts of the remains of the czar and his family (left: c. 1914: seated, from left, Olga, Nicholas II, Anastasia, Alexei, Tatiana; standing, Maria, Alexandra) had puzzled investigators since 1918. After investigator Avdonin (above right) located skulls and other bones in 1979, scientists in Russia and abroad (top left: Anastasia's skull; top right: a bone fragment from Alexei) went to work. "DNA testing was clear and convincing," says U.S. scientist Coble (above left).

THE BONES HAD BEEN FOUND. Now it was the job of the scientists to make them speak. The Russian government, and Peter Sarandinaki of the U.S.-based Search Foundation, which promotes forensic study of the Romanov remains, asked pre-eminent forensic experts to help identify the skeletons. They included Peter Gill of the Forensic Science Service in Birmingham, England, Pavel Ivanov of the Genetic Laboratory in Moscow and later Michael Coble of the Armed Forces DNA Identification Laboratory in Rockville, Maryland.

A human cell contains two genomes, or sets of genes: mitochondrial DNA, passed down by the mother, and nuclear DNA, inherited from both parents. Nuclear DNA, unique to each individual, provides the most powerful identification tool. But because only one set of nuclear DNA exists in a cell, it is often difficult to obtain an intact sample, particularly from aged sources. By contrast, mitochondrial DNA has hundreds to thousands of copies per cell; more of these molecules are likely to survive.

In this case, the scientists were fortunate: they succeeded in extracting nuclear DNA from all nine skeletons. They found striking similarities in five of them—enough to conclude that "the bones belonged to one family, and it looked like parents and three kids," says Evgeny Rogaev, a Russian-born geneticist at the University of Massachusetts, who was brought into the investigation.

The scientists also compared mitochondrial DNA from the female adult skeleton, presumably Alexandra, with that of a living DNA donor: Britain's Prince Philip, who shared a common maternal ancestor—Queen Victoria—with the czarina. It matched.

In 1994, Ivanov, the Moscow-based scientist, obtained permission from members of the Romanov family to exhume Georgy Romanov, the czar's younger brother, from

his grave in St. Petersburg. (Georgy had died suddenly in 1899, at age 28.) Ivanov found that Georgy's mitochondrial DNA was consistent with that of the adult male skeletal remains. Both samples also showed evidence of an extremely rare genetic mutation known as heteroplasmy.

The evidence led the forensic experts to one conclusion: the bones were those of Nicholas II, Alexandra and three of their five children. "The DNA testing was clear and convincing," Coble says.

But not everyone was persuaded. Some insisted that the bodies couldn't belong to the Romanovs, because there were only five related skeletons, not seven. In Japan, meanwhile, a forensic scientist, Tatsuo Nagai, performed DNA analysis on a handkerchief stained with Nicholas II's blood after a would-be assassin attacked the czar with a sword in Oda, Japan, in 1890. Nagai and a Russian colleague reported in 1997 that mitochondrial DNA from the bloody handkerchief did not match that from the bones the experts had determined to be Nicholas'. (The results were never published in a peer-reviewed journal and were not replicated; the findings have not gained acceptance.) Compounding the confusion, a forensic scientist at Stanford University obtained a finger bone of Alexandra's older sister, Elizabeth, who had been shot by Bolsheviks in July 1918 and tossed down a well. The mitochondrial DNA from the finger, he reported, was not consistent with DNA from the skeleton identified as that of Alexandra.

Those findings caused controversy, but scientists working with the Russian government contend that both the bloody handkerchief and the finger had been contaminated

Each July 17, the anniversary of the royal family's murder, religious services are conducted at Yekaterinburg's Church on the Blood (above left and at left), which was built on the site of the killings. After the services, clerics (above) walk several miles to Ganina Yama, where the church still maintains the bodies were buried. The czar's "tragic end," says the Rev. Belovolov, "could not leave any sane person indifferent."

with DNA from other sources, throwing off the results. Using this 80-year-old bone as a reference, says Coble, "ignored the entirety of the evidence."

President Boris Yeltsin and the Russian government agreed with Gill, Ivanov and the other forensic scientists. On July 17, 1998—the 80th anniversary of the killings—the remains that had first been uncovered in 1979 were interred beside other members of the Romanov dynasty in a chapel in St. Petersburg's state-owned Peter and Paul Cathedral.

Russian Orthodox Church authorities insisted that the remains were not those of the Romanovs. The Russian Orthodox patriarch, Alexei—with the support of several key Romanov descendants—refused to attend the ceremony.

EVER SINCE THE ROMANOV BONES came to light, Gribenyuk had yearned to locate the still-unrecovered remains of Maria and Alexei. Gribenyuk suspected that the czar's daughter and son were buried near the timber-covered grave that held the other Romanovs. In 2007, he put together a team of a half-dozen amateur forensic sleuths and headed for the Old Koptyaki Road. On their third search of the area, on July 29, 2007, they located some 40 bone fragments, buried in watery

soil at a depth of about one and a half feet, 230 feet from the other members of the royal family.

Coble, the U.S. Army scientist, analyzed the bone fragments and extracted mitochondrial and nuclear DNA from both specimens. He compared the results with data from the remains attributed to Nicholas, Alexandra and their three daughters.

His analysis showed that mitochondrial DNA from the bone fragments of the unidentified boy and girl was distinctly similar to that from Czarina Alexandra. Further analysis using nuclear DNA—which, again, is inherited from both parents—indicated "it was four trillion times more likely" that the young female was a daughter of Nicholas and Alexandra than that she was unrelated, Coble says. Likewise, it was "80 trillion times more likely" that the boy was a Romanov rather than an unrelated male.

Coble and other scientists conducted an additional genetic test, involving analysis of markers on Y chromosomes—genetic material passed down through the paternal line. They compared the boy's Y chromosome with those from the remains of Nicholas II as well as a living donor, Andrei Romanov, both of whom were descended from Czar Nicholas I. The testing, says Coble, "anchors Alexei to the czar and a living Romanov relative."

Finally, Solovyev, the Moscow investigator, remembered that a bloody shirt worn by Nicholas on the day of the assassination attempt in Japan had been given, in the 1930s, to the Hermitage Museum in St. Petersburg. The shirt had not been seen for nearly 60 years. It was eventually traced to a storage-room drawer. Because of the age of the blood and the possibility of contamination, "I was absolutely skeptical [of getting a good DNA sample]," says Rogaev, of the University of Massachusetts. "But it worked even better than the bone samples."

"This was the critical thing," says Coble. "We now had a sample of the czar's blood, and we had bone samples from after his death. We had living and post-mortem DNA. And they were a perfect match."

So far, the church has continued to challenge the authenticity of Maria's and Alexei's remains, just as it has refused to accept the identification of their parents' and siblings' skeletons. And the Russian leadership—President Dmitri Medvedev and Prime Minister Vladimir Putin—who are acutely sensitive to the power of the Russian Orthodox Church, have yet to authorize burial of the most recently unearthed remains with those of the other Romanovs in St. Petersburg. The bone fragments are stored inside a locked medical refrigerator at the Sverdlovsk Region Forensic Research Bureau in Yekaterinburg.

"The criminal case is closed; the bodies have been identified," says Tamara Tsitovich, a top investigator at the laboratory. "They should be buried as quickly as possible."

THE REV. GENNADY BELOVOLOV, 52, is a prominent clergyman within the Russian Orthodox Church in St. Petersburg. He grew up in the Caucasus, where he was taught in school that the czar was a weak-willed person who failed to save Russia at the most difficult moment of its history. After the fall of the Communists, Belovolov read Russian and foreign biographies, and "I came to see [the czar] as a man with tremendous morality and charm, and his tragic end could not leave any sane person indifferent," he says. "The story that happened to him became a symbol of what happened to Russia—the lost chance for greatness."

Interest in a return to the monarchy persists. Proponents include Georgy Fyodorov (above left), head of the Russian Imperial Union, a royalist group founded in 1929, and artist Xenia Vyshpolskaya (above), who specializes in portraits of the czars. Fyodorov predicts a coup d'état: "Someone like [Spain's] Franco [should] take power . . . clean up the mess, and in two or three years restore the monarchy."

Belovolov told me that, despite the scientific evidence, he still believed in Sokolov's 1918 conclusion that the royal family had been burned to ashes at Ganina Yama. "Seventy years later, new people came, they found the remains of unknown victims in a grave and declared they belonged to the czar. [But the Bolsheviks] executed many in the forest during that time." As for the bones of Maria and Alexei discovered three years ago by Gribenyuk and his friends, Belovolov said, "there are researchers who show completely different results. The church would be happy with only 100 percent certainty, nothing less."

The church has another reason to resist the new findings, according to several observers with whom I spoke: resentment of Yeltsin's role in rehabilitating the czar. "The church hated the idea that someone who was not only a secular leader but also a party functionary stole what they thought was their domain," says Maria Lipman, a journalist and civil society expert at the Carnegie Endowment for International Peace in Moscow. "This movement to sanctify the family of the czar—they wanted it to be theirs, and instead Yeltsin stole it."

A fascination with the Romanov family's "martyrdom," along with what many describe as a spiritual yearning for a strong, paternal leader, have led some Russians to believe that their country's salvation lies in the return of the monarchy. Each July 17, religious pilgrims retrace the route taken by the bodies of the Romanovs from the Ipatiev house to Ganina Yama; descendants of White Russian exiles have started monarchist societies; the great-grandchildren of Cossacks and Hussars who flourished under imperial rule have agitated for restoration of the Romanov line.

The Russian Imperial Union is a monarchist group founded by White Russian exiles in Paris in 1929. The union's leader, Georgy Fyodorov, 69, doesn't buy the forensic conclusions. "Nobody can give you 100 percent assurances that the [Old Koptyaki Road] bones are those of the emperor," said Fyodorov, the son of a White Russian Army major. "Nicholas told [his supporters] before he was killed: 'Don't look for my body.' He knew what would happen—it would be destroyed completely."

In support of their view, Fyodorov and Belovolov both cite the discredited results obtained from the Japanese handkerchief. And they question why the skull attributed to Nicholas bears no mark from the Japanese saber attack. (Forensic experts say that acidic ground conditions could have leached away such a marking.)

Fyodorov, who lives in St. Petersburg, said that Avdonin and his supporters have "political reasons" for pushing their version of events. "They want to put an end to it—'God bless them, goodbye Romanovs.' But we don't want [the issue] swept away. We want the monarchy to return."

Xenia Vyshpolskaya, a self-employed portraitist specializing in the Romanov czars, is not only pro-monarchy but might be considered pro-fascist as well. On her wall, squeezed in among the Romanovs, are framed photographs of Francisco Franco, Benito Mussolini and Chilean dictator

Princess Vera Obolensky (at her home in St. Petersburg) moved to Russia three years ago from Paris; she claims descent from Ivan the Terrible, who reigned from 1533 to 1584, and laments the end of royal rule: "The monarchy was brutally put to an end," she says, "and it was a tragedy for Russia."

Augusto Pinochet. Vyshpolskaya told me that her ambition is "to have a gallery of the world's right-wing leaders. . . . Each of them, like Nicolay, tried to take care of his people. You can agree or disagree with their methods."

Such sympathy for fascist strongmen is not unusual among those in Russia who, like Vyshpolskaya, support the return of the monarchy. The Russian Imperial Union's Fyodorov told me that he was hoping a right-wing general would overthrow the Russian government: "Someone like Franco [should] take power, become a dictator, clean up the mess, and in two or three years restore the monarchy."

"The monarchy was brutally put to an end, and it was a tragedy for Russia," says Princess Vera Obolensky, who claims to be a descendant of the 16th-century czar known as Ivan the Terrible. She grew up in Paris and emigrated to St. Petersburg three years ago.

"The monarchy is a romantic idea," says French historian Mireille Massip, an expert on White Russian exiles. "Democracy is not popular, because democrats turned out to be total losers. Communists aren't popular. Monarchism is seen as something fresh and fashionable."

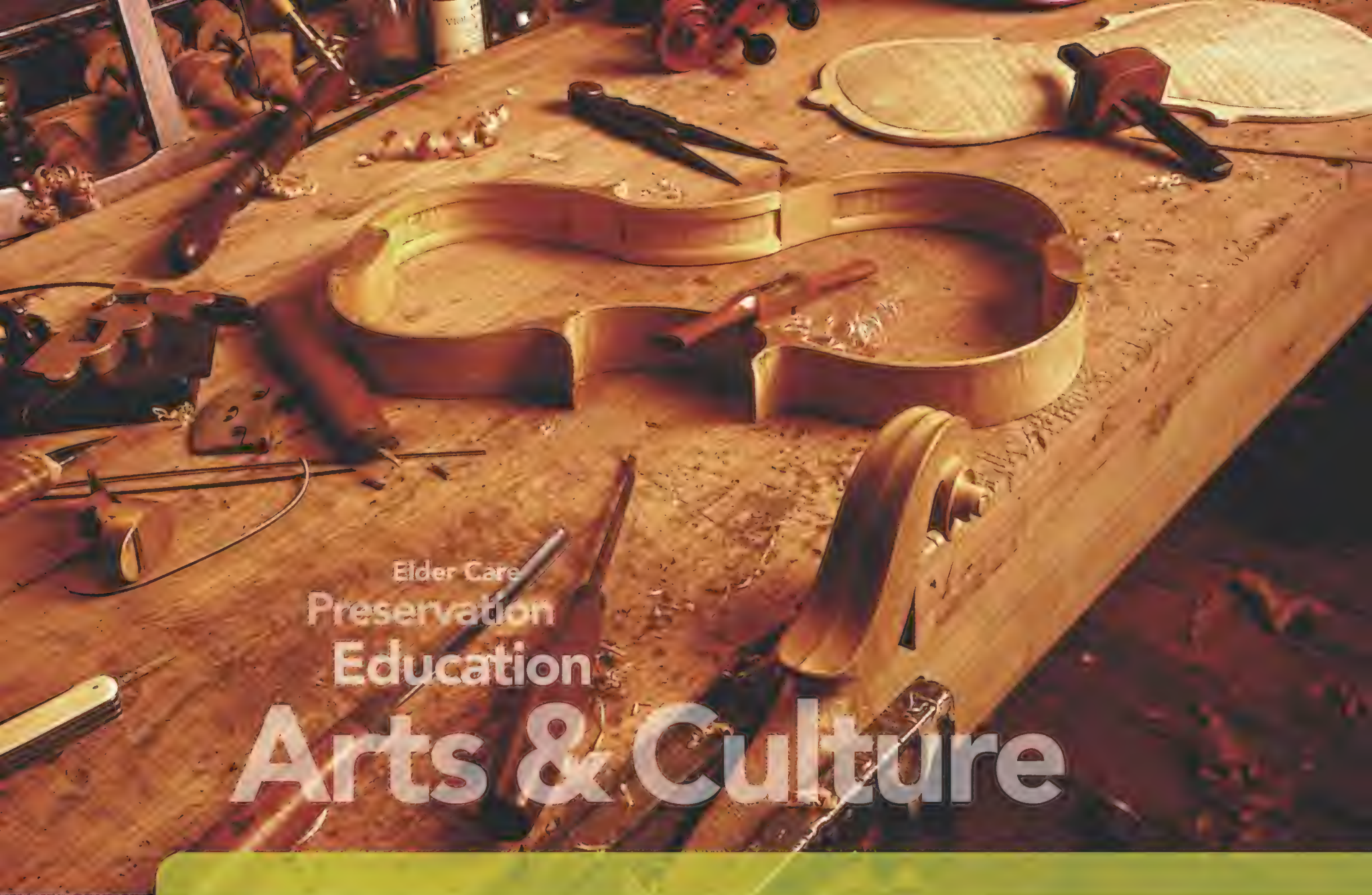
THE RUSSIAN ORTHODOX CHURCH has created a memorial to Nicholas and his family in the woods at Ganina Yama. When I visited it with Gribenyuk, we parked next to a row of tour buses and walked through a wooden gate flanked by souvenir kiosks. Tourists and pilgrims browsed through Nicholas pins, postcards and orthodox icons. Perhaps nowhere was the link between the church and the royal family more evident. Religious choral music blared from loudspeakers. Just beyond a large bust of Nicholas, its base inscribed with the words "Saint, Great Martyr and Czar," footpaths led to a dozen churches of varying sizes scattered through the woods. Each of these impressive structures, constructed of rough-hewn logs and topped by a green-tile roof and golden dome, was dedicated to a different patron saint of the Romanovs. We approached a plank walkway that surrounds a grass-covered pit—the abandoned mine where the Bolshevik death squad first dumped the corpses after the regicide. One worshiper was laying a bouquet of white lilies on the grass. Priests and tour groups led by young acolytes wandered past. "The church has really built this [complex] up," Gribenyuk observed.

At the same time, the church appears poised to obliterate the sites uncovered by Avdonin and Gribenyuk, a few miles away, where, according to the government and forensic scientists, the Romanov remains were found. Last year, the church tried to acquire the land and announced plans to construct at the site a four-acre cemetery, a church and other structures bearing no connection to the Romanovs.

"It is enough to cover up everything," said Gribenyuk.

This past spring, he and others filed a legal action to block the project, arguing that it would destroy one of Russia's most important landmarks. (As we went to press, the court ruled against the church. The decision is likely to be appealed.)"The bodies were buried here 92 years ago," Gribenyuk said, "and now the church wants to bury the memory of this place again."

See more photographs and share this story at smith.hy.pr/czar



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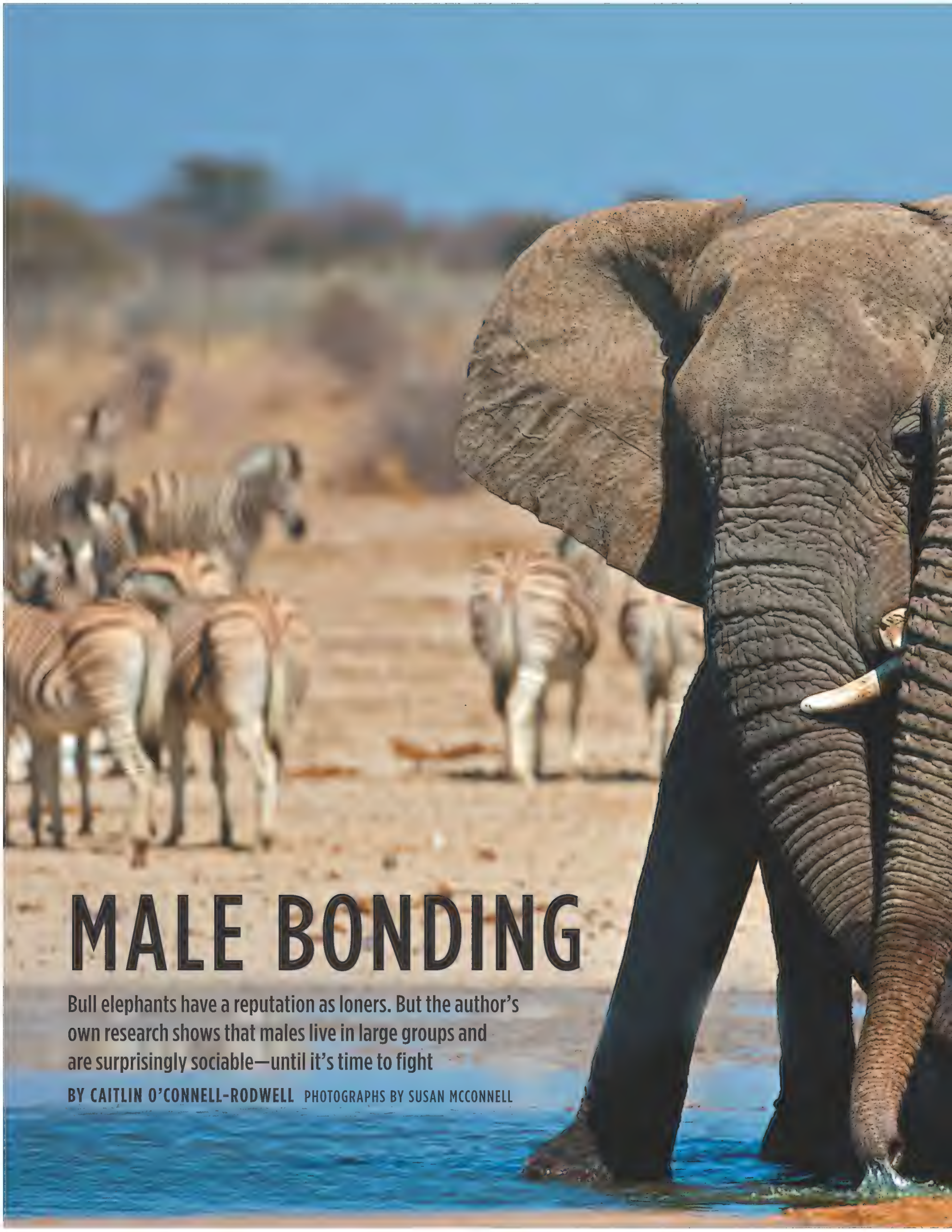
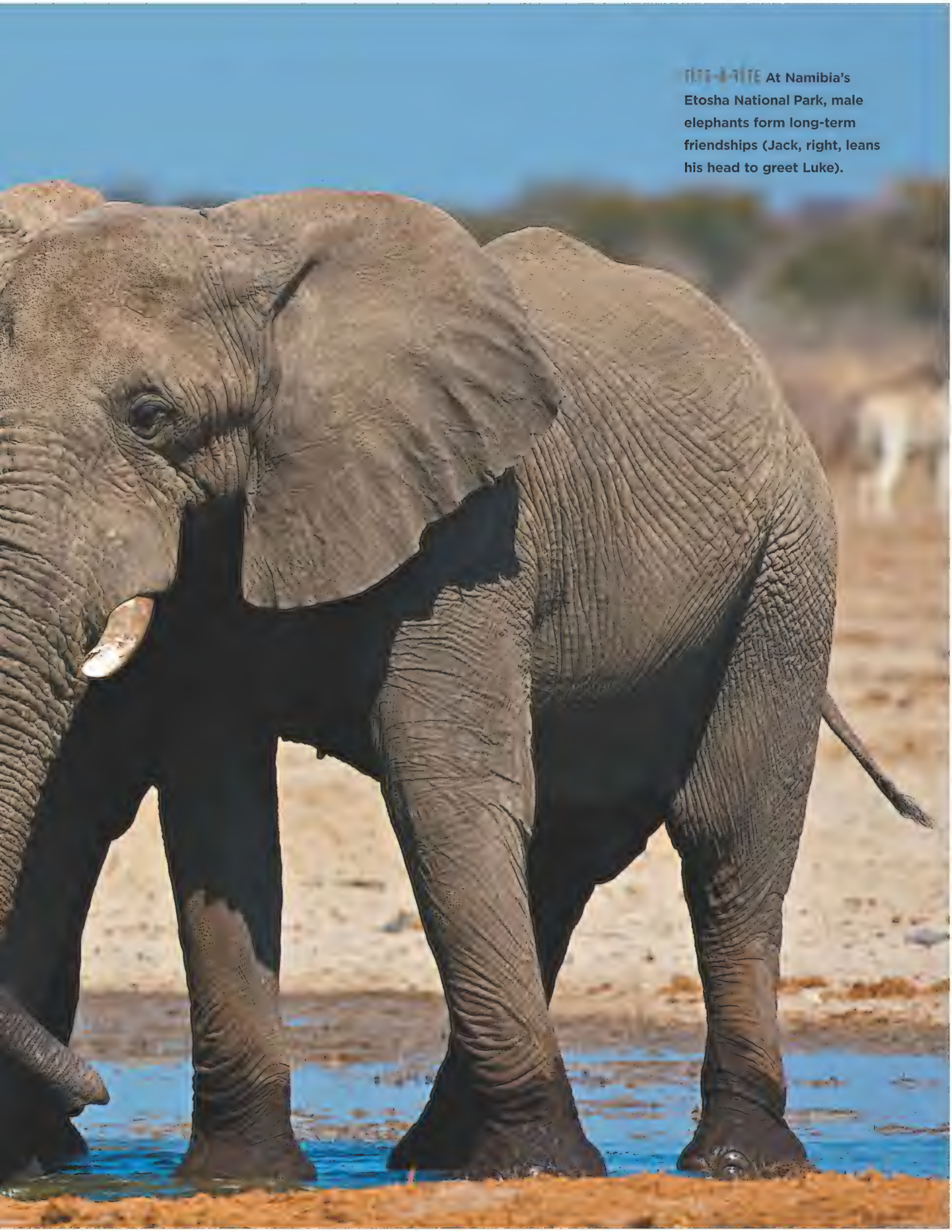


MALE BONDING

Bull elephants have a reputation as loners. But the author's own research shows that males live in large groups and are surprisingly sociable—until it's time to fight

BY CAITLIN O'CONNELL-RODWELL PHOTOGRAPHS BY SUSAN MCCONNELL



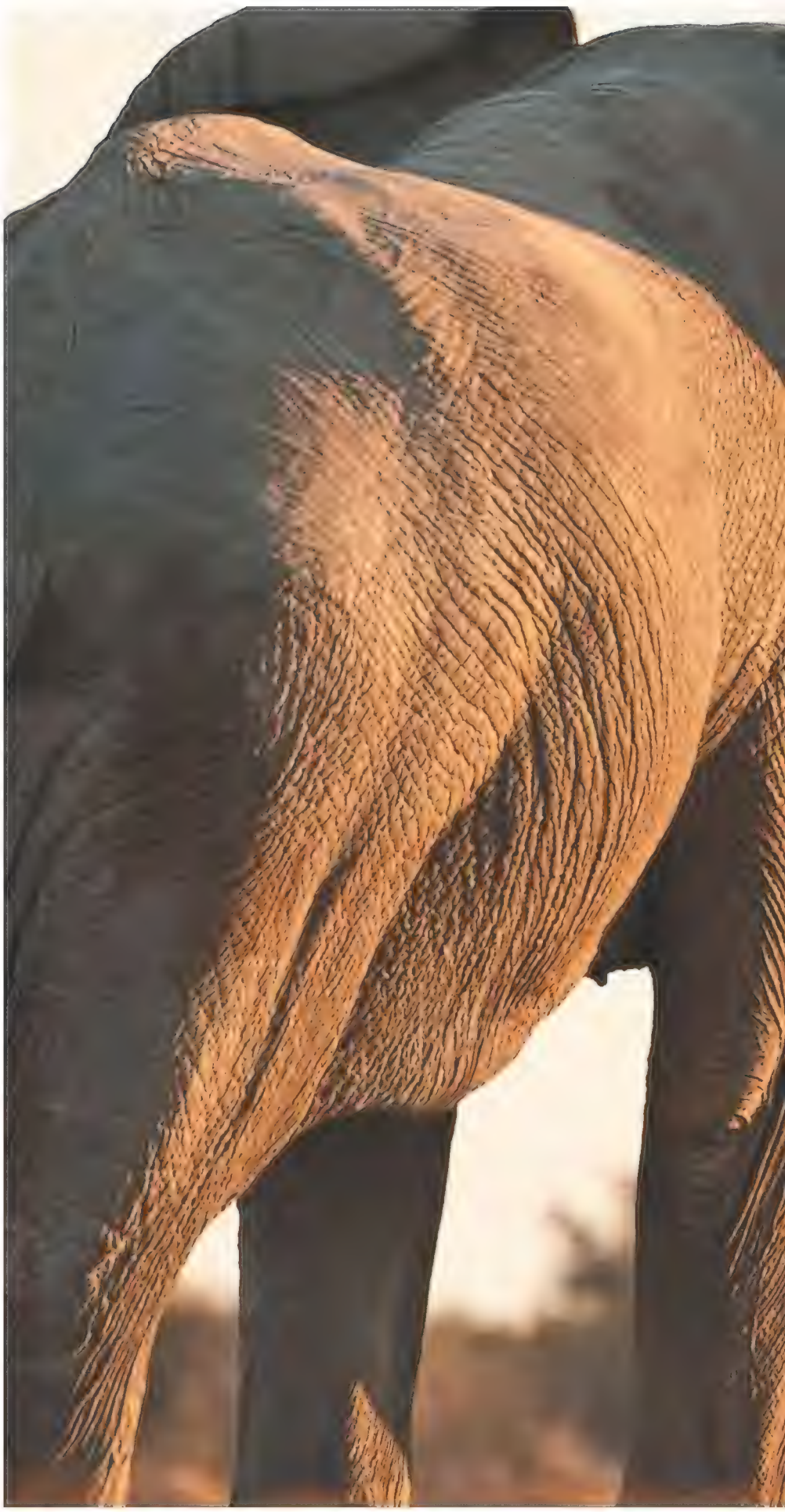
TIT-A-TITE At Namibia's Etosha National Park, male elephants form long-term friendships (Jack, right, leans his head to greet Luke).

While sipping tea one morning and enjoying the expansive view of a water hole from my 25-foot-tall research tower, I could see a storm of epic proportions brewing.

My colleagues, students, volunteers and I were at Mushara, a remote water source in Namibia's Etosha National Park, to study the dynamics of an all-male society, bull elephant style. I'd been coming to this site for 19 years to study elephants, and the complexity of the bulls' relationships was becoming more and more striking to me.

Male elephants have a reputation as loners. But in Amboseli National Park in Kenya, where the longest-running studies on male elephants have been conducted, bulls have been observed to have a best friend with whom they associate for years. Another study, in Botswana, found that younger males seek out older males and learn social behaviors from them. In my previous field seasons at Mushara, I'd noticed that males had not just one close buddy but several, and that these large groups of males of mixed ages persisted for many years. Of the 150 bulls that we were monitoring, the group I

LEARNING THEIR LANGUAGE **Caitlin O'Connell-Rodwell (below: in an observation bunker near Mushara water hole) tracks shifting social dynamics in the "boys' club." Right: Tyler hangs his trunk on his tusk in anticipation as Congo Connor sniffs and begins to extend his trunk in greeting.**



was particularly interested in, which I called the "boys' club," comprised up to 15 individuals—a dominant bull and his entourage. Bulls of all ages appeared remarkably close, physically demonstrating their friendship.

Why was this group so large and its members so tight? What held them together? And how was dominance decided and maintained? Now, as I trained my binoculars at the water hole, I looked for answers to these questions, and witnessed a showdown.

Like many other animals, elephants form a strict hierarchy, which reduces conflicts over scarce resources such as water, food and mates. At Mushara, an artesian well provides the best water, which is funneled into a concrete trough—a remnant of an old cattle farm built before this area was incorporated into the park. The outflow of the well at the head of the trough, which has the cleanest, most palatable water and is equivalent to the head of a table, was clearly reserved for the top-ranking elephant—the one I referred to as the don.

As five members of the boys' club arrived for a drink, I quickly noticed that two young, low-ranking bulls weren't up to their usual antics. Jack and Spencer, as I called them,

were agitated. They kept shifting their weight and seemed desperate for reassurance, with one or the other holding his trunk out tentatively, as if seeking comfort from a higher-ranking bull's ritualized trunk-to-mouth greeting.

Keith and Stoly, more senior bulls, ignored these attempts at engagement. They offered no reassuring gestures such as a trunk over a youngster's back, or an ear over a head or rear. Instead, they and the younger bulls seemed to be watching Greg, the don. And he was obviously in a foul temper.

Greg, about 40 years old, was distinguishable by two square notches out of the lower portion of his left ear. But there was something else, something visible from a long way off, that identified him. This guy had the confidence of a general—the way he held his head, his casual swagger. And for years now, whenever Greg strutted up to the water hole, the other bulls slowly backed away to allow him access.

When Greg settled in to drink, each bull in turn approached him with an outstretched, quivering trunk, dipping the tip into Greg's mouth as though kissing a human don's ring. After performing this ritual and seeing a placated Greg, each bull's shoulders seemed to relax and each slouched

submissively away from Greg's preferred drinking spot.

It was a behavior that never failed to impress me—one of those reminders that human beings are not as unique in social complexity as we like to think. This culture was steeped in ritual.

Despite the other males' deference, Greg still seemed agitated. He fitfully shifted his weight from one front foot to the other and spun his head around to watch his back and give his best stink eye to some phantom pursuer, as if somebody had tapped him on the shoulder in a bar, trying to pick a fight.

I scanned the horizon to see if any more bulls were heading our way. Considering Greg's increasing agitation, I thought he might be sensing an approaching rival. In my earlier research here, I'd discovered that elephants can hear rumbles too deep for human hearing and use their feet and trunks to sense rumbles that travel through the ground for miles. Elephants can even recognize one another through these vibrations.

Perhaps Greg sensed a bull in musth. A male entering the hormonal state of musth is supposed to experience a kind of Popeye effect—the equivalent of downing a can of spinach—that trumps established dominance patterns. Not even an alpha male would risk challenging a bull elephant with a heightened level of testosterone. Or so I thought.

An elephant in musth is looking for a mate with such singularity of purpose that he hardly takes the time to eat or drink. He engages in exaggerated displays of aggressiveness such as curling the trunk across the brow with ears waving—presumably to facilitate the wafting of a sticky, musthy secretion from temporal glands above the cheek, just behind the eye—while excreting urine, sometimes to the point of gushing. The message is the elephant equivalent of "don't even think about messing with me 'cause I'm so crazy-mad that I'll tear your head off." Other bulls seem to understand this body language quite well.

While Greg twitched, the mid-ranking bulls were in a state of upheaval. Each seemed to be showing his good relations with higher-ranking individuals: Spencer leaned against Keith on one side, and Jack on the other, placing his trunk in Keith's mouth—Keith being a favorite of the don. The most sought-after connection was with Greg himself, who often allowed certain privileged lower-ranking individuals to drink right next to him.

But today Greg was in no mood for brotherly backslapping. Stoly, who ordinarily enjoyed Greg's beneficence, cowered in the overflow from the trough, the lowest-ranking position where water quality was poorest. He sucked his trunk, as if uncertain how to negotiate his place in the hierarchy.

By now I had been in the tower two hours; it was nearly noon, and the day had turned hot and bleak. It had been a particularly dry year, so the trees were parched and the clearing especially stark. As Greg became more and more agitated, I could sense that nobody wanted to be in the presence of an angry don.

Finally the explanation strode in on four legs, his shoul-

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SUSAN MCCONNELL *is a neurobiologist at Stanford.*

MAP: GUILBERT GATES

ders high and head up, clearly looking for trouble. It was the third-ranking bull, Kevin, the group bully who frequently sparred with the lower-ranking bulls. I could identify him by his wide-splayed tusks and bald tail. I could also see the telltale sign of urine dribbling from his penis sheath, and, judging from his posture and long stride, he appeared ready to take on Greg. Kevin was obviously in musth.

I had never witnessed a musth bull challenging a dominant bull, and as Kevin arrived at the water hole, I was on the edge of my seat. I suspected that Greg had been avoiding Kevin, and I fully expected Greg either to back down or to get the daylights beaten out of him. Everything I had read suggested that a rival in musth had the advantage in a fight with a top-ranking bull. Such confrontations have even been known to end in death.

FEMALE ELEPHANTS LIVE much of their lives apart from males, in family groups led by a matriarch. A mother, grandmother and maybe even a great-grandmother live together with daughters, nieces, granddaughters and their offspring—on average, about 15 individuals. Young males leave the group when they are between 12 and 15 years old; the females stay together as long as they live, which can be up to 70 years. The matriarch, usually the oldest in the group, makes decisions about where and when to move and rest, on both a daily and seasonal basis.

Among female elephants, or cows, gestation lasts 22 months, and babies are weaned after two years, so estrous cycles are spaced from four to six years apart. Because of this long interval, relatively few female elephants are ovulating in any one season. Females are thought to advertise estrus through hormones secreted in their urine as well as through the repetition of a vocalization called an estrus rumble. Musth bulls also have a particular rumble that advertises their status to estrus females.

Only a few bulls go into musth at any one time. The prevailing theory is that this staggering of bulls' musth allows lower-ranking males to gain a temporary advantage over higher-ranking ones by becoming so agitated that dominant bulls won't want to take them on, even in the presence of a female ready to mate. This mechanism allows more males to mate, rather than just the don, which makes the population more genetically diverse.

Although females do not go into estrus at the same time, more of them tend to become fertile at the end of the rainy season, which allows them to give birth in the middle of another rainy season, when more food is available. Long-term studies in Amboseli indicate that dominant bulls tend to come into musth when a greater number of females are in estrus, and they maintain their musth longer than younger, less dominant bulls. But this was the dry season, and Greg exhibited no signs of musth.

FIGHT OR PLAY? From opposite left: two young bulls extend their trunks in an encounter that could lead to a friendly greeting or a clash; the bull on the left places the tip of his trunk in his mouth, a sign of uncertainty; he then tosses his trunk over the other bull's head, initiating a gentle sparring match. Below: The fight between Greg (back to video camera) and Kevin contradicted expectations.

Watch the elephants clash at Smithsonian.com/fight

LOWER RIGHT: O'CONNELL & RODWELL / UTOPIA SCIENTIFIC

AT THE WATER HOLE, Kevin swaggered up for a drink. The other bulls backed away like a crowd avoiding a street fight. Not Greg. He marched clear around the water with his head held high, back arched, straight toward Kevin. Kevin immediately started backing up.

I had never seen an animal back up so sure-footedly. Kevin kept his same even and wide gait, only in reverse.

After a retreat of about 50 yards, Kevin squared off to face his assailant. Greg puffed himself up and kicked dust in all directions. He lifted his head even higher and made a full frontal attack.

Two mighty heads collided in a dusty clash. Tusks met in an explosive crack, with trunks tucked under bellies to stay clear of the mighty blows. Greg held his ears out to the sides, with the top and bottom portions folded backward and the middle protruding—an extremely aggressive posture. And using the full weight of his body, he raised his head again and slammed Kevin with his tusks. Dust flew, with Kevin in full retreat.

I couldn't believe it—a high-ranking bull in musth was getting his hide kicked. A musth bull was thought to rise to the top of the hierarchy and remain there until his testosterone levels returned to normal, perhaps as long as several months. What was going on?

But just when I thought Greg had won, Kevin dug in. With their heads only inches apart, the two bulls locked eyes and squared up again, muscles taut.

There were false starts, head thrusts from inches away and all manner of insults cast through foot tosses, stiff trunks and arched backs. These two seemed equally matched, and for a half-hour the fight was a stalemate.

Then Kevin lowered his head. Greg seized the moment. He dragged his own trunk on the ground and stamped purposefully forward, lunging at Kevin until the lesser bull was finally able to maneuver behind a concrete bunker we use for ground-level observations.

Feet stamping in a sideways dance, thrusting their jaws out at each other, the two bulls faced each other across the bunker. Greg tossed his trunk across the nine-foot divide in what appeared to be frustration. At last he was able to break the standoff, catching Kevin in a sideways attack and getting him out in the open.

Kevin retreated a few paces, then turned and walked out of the clearing, defeated.

I WAS BLOWN AWAY by what I had just witnessed. A high-ranking bull in musth was supposed to be invincible. Were the rules of musth different for bulls that have spent most

FEMALE SOCIETY **Elephant family groups are matriarchal, with the oldest female leading her daughters, granddaughters and other female or juvenile kin (right: the cow at the center displays vigilance with her upturned head and extended ears). Baby elephants (below) are kept at the center of a herd, where they are safest from predators.**

of their time in a close social group? Kevin hadn't frightened Greg; if anything, Kevin's musth appeared to fuel Greg's aggression. Greg, I realized, would simply not tolerate a usurpation of his power.

My mind raced over the possible explanations. Had Etosha's arid environment created a different social atmosphere than Amboseli's, where similar conflicts had had the opposite outcome? Perhaps water scarcity influenced social structure—even the dynamics of musth.

Could it be that the don had an influence over the other males' hormones? This phenomenon is well documented in the primate world. And in two instances in South Africa, when older bulls had been reintroduced to a territory, younger bulls had then cycled out of musth. Did a bull have to leave his group to go into musth? This episode with Kevin made me think that just might be the case. And that would explain why musth bulls are usually alone while they search for females.

When the dust settled, some of the lower-ranking bulls still seemed agitated. The boys' club never really returned to normal for the rest of the day.

In the early afternoon, Greg determined it was time to leave. He set the trajectory, leaning forward and laying his trunk on the ground—as if gathering information to inform his decision. He remained frozen in that position for more than a minute before pointing his body in a new direction.

When Greg finally decided to head west, he flapped his ears and emitted a long, barely audible low-frequency call that has been described as a "let's go" rumble. This was met with ear flapping and low rumbles from several other bulls. On some days, I'd seen him give a shove of encouragement to a younger bull reluctant to line up and leave the water hole. This time, it was Keith who was balking; Greg put his head against Keith's rear and pushed. The bulls finished drinking and headed out in a long line, Greg in the lead.

Dominance among female elephants means leading. The matriarch decides where the group should go and when. Dominance in bulls has been thought to be different, a temporary measure of who could stay on top of the heap, who could physically overpower the other members of the group and mate with the most females. It isn't about caring whether the group sticks together. But dominance seemed to mean something more complicated to these bulls. I began to wonder whether I was witnessing not just dominance but something that might be called leadership. Greg certainly appeared to be rounding up the group and leading his bulls to another carefully selected venue.

As I watched the boys' club disappear in a long chalky line into the trees, I wondered if paying respects to the don went beyond maintaining the pecking order. I felt a little

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LOWER LEFT: O'CONNELL & RODWELL

crazy even thinking it, but these bull elephants, who weren't necessarily related, were behaving like family.

A FEW SEASONS HAVE PASSED since that afternoon at Etosha. This past summer Greg developed a gaping hole near the tip of his trunk—probably an abscess. It caused him to spill water as he drank. He appeared to have lost a lot of weight, and he spent a lot of time soaking his wound after drinking. He seemed extremely grumpy, casting off friendly overtures with a crack of his ears. It looked like he didn't want company.

Yet on occasion he still came to the water hole with his younger contingent: Keith, Tim and Spencer, as well as some new recruits, Little Donnie and Little Richie. The newcomers made me wonder if Greg might pull through this rough patch. The youngsters were fresh out of their matriarchal families and looking for company, and they seemed eager to be by Greg's side. Despite his crabby mood, Greg seemed to still know how to attract young constituents—those that might be there for him during conflicts with challengers who aren't in musth.

As we were packing up to leave for the season, Greg lumbered in for one of his long drinking sessions—his new recruits in tow. The younger bulls had long since left the area by the time Greg had finished soaking his trunk and was ready to depart. Despite being alone, he initiated his

READING THE SOCIAL SIGNS **Males at the water hole often nuzzle or spar. Luke (left: missing his right tusk) tries to push other bulls around. A young male (below) offers his trunk to an older male's mouth, an act of supplication. Will Greg's wounded trunk (below left) depose him as the don?**

ritual rumbling as he left—his long, low calls unanswered—as if engaging in an old habit that wouldn't die.

It was a haunting scene. I stopped and watched through my night vision scope. I couldn't help but feel sorry for him as he stood at the edge of the clearing. What was he waiting for?

Later, I got my answer. I heard rumbles in the distance—two bulls vocalizing. When I looked through my night vision scope again, I saw that Greg was with Keith. Perhaps Keith, having had his drink hours earlier, had returned to collect him.

Greg and Keith walked out together, each in turn rumbling and flapping his ears. They lumbered up a path and out of sight.

I felt relieved.

THE TELL-TALE MURDER

In 1830, a brutal crime in Salem riveted the nation—and inspired the writings of Edgar Allan Poe and Nathaniel Hawthorne

BY E. J. WAGNER ILLUSTRATIONS BY CHRIS BEATRICE

On the evening of April 6, 1830, the light of a full moon stole through the windows of 128 Essex Street, one of the grandest houses in Salem, Massachusetts. Graced with a beautifully balanced red brick facade, a portico with white Corinthian columns and a roof balustrade carved of wood, the three-story edifice, built in 1804, was a symbol of prosperous and proper New England domesticity. It was owned by Capt. Joseph White, who had made his fortune as a shipmaster and trader.

A childless widower, White, then 82, lived with his niece, Mary Beckford ("a fine looking woman of forty or forty-five," according to a contemporary account), who served as his housekeeper; Lydia Kimball, a domestic servant; and Benjamin White, a distant relative who worked as the house handyman. Beckford's daughter, also named Mary, had once been part of the household, but three years earlier she had married young Joseph Jenkins Knapp Jr., known as Joe, and now lived with him on a farm seven miles away in Wenham. Knapp was previously the master of a sailing vessel White owned.

That night, Captain White retired a little later than was his habit, at about 9:40.

At 6 o'clock the following morning, Benjamin White arose to begin his chores. He noticed that a back window on the ground floor was open and a plank was leaning against it. Knowing that Captain White kept gold doubloons in an iron chest in his room, and that there were many other valuables in the house, he feared that burglars had gained access to it. Benjamin at once alerted Lydia Kimball and then climbed the elegant winding stairs to the second floor, where the door to the old man's bedchamber stood open.

Captain White lay on his right side, diagonally across the bed. His left temple bore the mark of a crushing blow, although the skin was not broken. Blood had oozed onto the bedclothes from a number of wounds near his heart. The body was already growing cold. The iron chest and its contents were intact. No other valuables had been disturbed.

I first read of the Salem murder many years ago in a Greenwich Village secondhand bookshop. I'd ducked inside to escape a sudden downpour, and as I scanned the dusty shelves, I discovered a battered, coverless anthology of famous crimes, compiled in 1910 by San Francisco police captain Thomas Duke.

The chapter on Captain White's savage killing, evocative of the golden age mystery tales of the late 19th century, riveted me at once. The famed lawyer and congressman Daniel Webster was the prosecutor at the ensuing trial. His sum-

PEABODY ESSEX MUSEUM, SALEM, MA, #2987

Opposite: Richard Crowninshield bludgeoned 82-year-old Capt. Joseph White (above: in a portrait painted years before the crime) while the former slave trader and shipmaster slept. A skilled machinist, Crowninshield honed the murder weapon himself.

mation for the jury—its inexorable cadence, the slow gathering of dreadful atmospheric details—tugged at my memory, reminding me of Edgar Allan Poe's tales of terror. In fact, after talking with Poe scholars, I learned that many of them agreed the famous speech had likely been the inspiration for Poe's story "The Tell-Tale Heart," wherein the narrator boasts of his murder of an elderly man. Moreover, I discovered, the murder case had even found its way into some of Nathaniel Hawthorne's works, with its themes of tainted family fortunes, torrential guilt and ensuing retribution.

Those facts alone proved an irresistible magnet to a crime historian like me. But the setting—gloomy, staid Salem, where in the 1690s nineteen men and women were convicted of witchcraft and hanged—endowed the murder case with another layer of gothic intrigue. It almost certainly fed the widespread (and admittedly lurid) fascination with the sea captain's death among the American public at the time. The town, according to an 1830 editorial in the *Rhode Island American*, was "forever . . . stained with blood, blood, blood."

SOON AFTER THE DISCOVERY of the body, Stephen White—the murdered man's nephew and a member of the Massachusetts legislature—sent for Samuel Johnson, a prominent Salem physician, and William Ward, Captain White's clerk and business assistant. Ward made note of the plank at the open window, and near it he discovered two muddy footprints he believed had been made by the intruder. Decades before footprints were generally recognized as important evidence, Ward carefully covered them with a milk pan to shield them from the fine mist that had begun to fall. Meanwhile, Dr. Johnson's cursory examination revealed the body was not quite cold; he concluded that death had occurred three to four hours earlier.

Dr. Johnson then performed an autopsy before a "coroner's jury" comprised of local citizens, whose role was to assess the initial facts and determine whether a crime had taken place. In the jury's presence, Johnson carefully examined the corpse, stripping off the shirt and inserting probes into some of the stab wounds to determine their depth and direction. He counted 13 stab wounds—"five stabs in the region of the heart, three in front of the left pap [nipple], and five others, still further back, as though the arm had been lifted up and the instrument struck underneath." He attributed all the stab wounds to the same weapon, which suggested that there had been a single murderer. Though the wounds had oozed, there was no sign of spurting or spraying blood. Johnson interpreted this to mean that the blow to the head had come first, either killing White or stunning him, thereby slowing his circulation. Uncertain as to which of the many wounds was fatal, Johnson believed that a more complete autopsy was necessary.

This was performed on April 8, at 5:30 in the evening. Dr. Abel Peirson, a medical colleague, assisted Johnson. A second post-mortem as thorough as this one was unusual in early 19th-century criminal investigations. In 1830, forensic science was still largely a footnote in legal and medical texts. But thanks to increasingly rigorous anatomical studies in medical schools, there had been progress in identifying murder instruments based upon the nature of the wounds and determining which had been the most likely cause of death.

A break in the investigation came when a petty thief testified that he had overheard the Crowninshield brothers plotting the crime in a gambling house.

The surgeons agreed that the skull fracture was due to a single severe blow from a cane or bludgeon, and that at least some of the chest wounds were caused by a dirk (short dagger), the cross-guard of which had struck the ribs with enough force to break them. Peirson disagreed with Johnson's initial

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Crime historian **E.J. WAGNER** *is the author of* The Science of Sherlock Holmes. **CHRIS BEATRICE** *is a book and magazine illustrator who lives in Massachusetts.*

Salem residents armed themselves with knives, pistols and watchdogs, and the sound of new locks being hammered in place was everywhere.

assessment that there was likely only one assailant. A medical consensus was elusive, in part, because of the 36-hour interval between inquest and the second autopsy—which had allowed extensive post-mortem changes, affecting the appearance of the wounds, as had Johnson's initial insertion of a probe.

Stephen White gave the *Salem Gazette* permission to publish the autopsy findings. "However revolting the subject may be," the newspaper said, "we have deemed it our duty to lay before our readers every particle of authentic information we can obtain, respecting the horrible crime which has so shocked and alarmed our community."

The possibility that more than one assailant might have been involved and that a conspiracy might be afoot fueled unease. Salem residents armed themselves with knives, cutlasses, pistols and watchdogs, and the sound of new locks and bolts being hammered in place was everywhere. Longtime friends grew wary of each other. According to one account, Stephen White's brother-in-law, discovering that Stephen had inherited the bulk of the captain's estate, "seized White by the collar, shook him violently in the presence of family" and accused him of being the murderer.

Town fathers attempted to calm matters by organizing a voluntary watch and appointing a 27-man Committee of Vigilance. Although not burdened by any experience in criminal investigation, its members were given the power to "search any house and interrogate every individual." Members took an oath of secrecy and offered a $1,000 reward for information "touching [on] the murder."

But the investigation went nowhere; the committee was confronted with a scenario of too many suspects and too little evidence. No one had made plaster casts of the incriminating footprints that Ward had carefully covered the morning of the murder. (By 1830, scientists and sculptors were using plaster casts for preserving fossil specimens, studying human anatomy and recreating famous sculptures—but the technique was not yet de rigueur in criminal investigations.)

Since nothing had been stolen, the assailant's motive puzzled townspeople and authorities alike. But revenge was not out of the question. As many in Salem knew, Joseph White was hardly the "universally respected and beloved" old man one local newspaper described. A bit of a domestic tyrant, he was given to changing his will at a whim and using his large fortune as a weapon to enforce his wishes. When his pretty young grandniece Mary announced her engagement to Joe Knapp, the old man declared Joe a fortune hunter, and when the marriage went forward without his consent, White disinherited Mary and fired Knapp.

What's more, White had been a slave trader. The ownership of slaves was abolished in Massachusetts in 1783 and the slave trade outlawed five years later. Yet White had boasted to Salem minister William Bentley in 1788 that he had "no reluctance in selling any part of the human race." (In Bentley's estimation, this "betray[ed] signs of the greatest moral depravity.") In a water-stained letter written in 1789 that I found deep in the archives of the Peabody Essex Museum in Salem, a sailor named William Fairfield, who served on the schooner *Felicity*, told his mother about a slave revolt that had killed the ship's captain. Joseph White was one of the owners of the *Felicity*.

Some of White's ships had engaged in legitimate trade, hauling everything from codfish to shoes. But many had sailed from Salem laden with tools and trinkets, to be traded in Africa for human cargo. Manacled and cramped into ghastly holds, many of the captives did not survive the voyage. Those who did were traded in the Caribbean for gold—enough to buy property, build a mansion and fill an iron chest.

Crime scene: The Gardner-Pingree House (above) was restored to its 1814 grandeur.

"Many maritime families in Salem supported the slavery system in one way or another," says Salem historian Jim McAllister. That was how they had built their fortunes and paid their sons' Harvard tuitions. There was an understanding in Salem society that this shameful business was best not spoken of, particularly in Massachusetts, where antislavery sentiments ran high. "A few of our merchants, like others in various seaports, still loved money more than the far greater riches of a good conscience, more than conformity with the demands of human rights, with the law of the land and the religion of their God," Salem minister Joseph B. Felt wrote in 1791.

A LITTLE MORE THAN A WEEK AFTER the murder, Stephen White received a letter from a jailer 70 miles away in New

Newspaper reporters descended on Salem from as far away as New York City—ostensibly with the lofty goal of ensuring that justice be achieved.

Bedford. The letter said an inmate named Hatch, a petty thief, claimed he had crucial information. While frequenting gambling houses in February, Hatch had overheard two brothers, Richard and George Crowninshield, discussing their intent to steal Joseph White's iron chest. The Crowninshield brothers were the disreputable scions of an eminent Salem family. Richard, according to court transcripts, was known to favor Salem's "haunts of vice." The town's Committee of Vigilance brought Hatch in chains to testify before a Salem grand jury. On May 5, 1830, the jury indicted Richard Crowninshield for murder. His brother George—and two other men who were in his company at the gambling house—were charged with abetting the crime. All were detained in the Salem Gaol, a grim edifice of granite blocks, iron-barred windows and brick-walled cells.

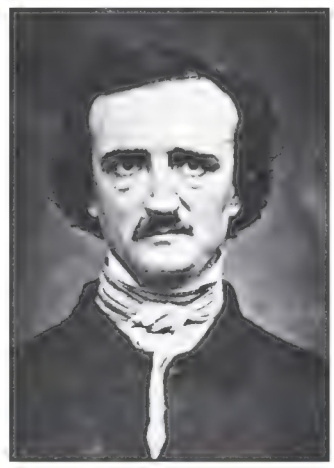
Then, on May 14, Joseph Knapp Sr., the father of the man who had married White's disinherited grandniece, received a letter from Belfast, Maine. It demanded a "loan" of $350, and threatened disclosure and ruin if this were not promptly paid. It was signed "Charles Grant."

The senior Knapp could make no sense of the matter and asked his son for advice. It's "a devilish lot of trash," Joe Knapp Jr. told his father and advised him to give it to the committee.

The Committee of Vigilance pounced on the letter. It sent $50 anonymously to Grant at his local post office, with a promise of more to come, and a man was dispatched to apprehend whoever collected the money. The recipient turned out to be John C.R. Palmer. Arrested as a possible accessory to the murder, but promised immunity for his testimony, he told a complex tale: during a stay at the Crowninshield family home, Palmer had overheard George tell Richard that John Francis ("Frank") Knapp, a son of Joseph Knapp Sr., wanted them to kill Captain White—and that Joe Jr., Frank's brother, would pay them $1,000 to commit the crime. The Committee of Vigilance promptly arrested the Knapp brothers and sent them to the Salem Gaol, their cells not far from those occupied by the Crowninshields.

At first, Richard Crowninshield exuded a sense of rectitude, certain that he would be found innocent. During his imprisonment, he asked for books on mathematics and Cicero's Orations, and conveyed nonchalance—until the end of May, when Joe Knapp confessed to his role in the murder plot.

The confession was given to the Rev. Henry Colman, an intimate friend of the White family. Colman also had close connections to the Committee of Vigilance, and in this role had promised Joe immunity from prosecution in exchange for his testimony.



Inspired by the trial, Edgar Allan Poe (top: in 1848) and Nathaniel Hawthorne (above: in an 1840 portrait) both incorporated themes of murder and guilt into their fictional writings.

The nine-page confession—in Colman's handwriting but signed by Knapp—began, "I mentioned to my brother John Francis Knapp, in February last, that I would not begrudge one thousand dollars that the old gentleman, meaning Capt. Joseph White of Salem, was dead." It went on to explain that Joe Knapp believed if Captain White died without a legal will, his fortune would be divided among his close relatives, giving Mary Beckford, Knapp's mother-in-law, a considerable fortune.

To this end, Joe opened Captain White's iron chest four days before the murder and stole what he erroneously believed to be the old man's legal will. The true last will of Joseph White, favoring his nephew Stephen, was safely in the office of the dead man's lawyer. But Joe was unaware of this fact. He hid the document in a box he covered with hay and burned the stolen paper the day after the murder.

Joe and Frank had debated how to commit the murder. They considered ambushing White on a road or attacking him in his house. Frank, however, told Joe that "he had not the pluck to do it," and suggested hiring Richard and George Crowninshield, whom the Knapp brothers had known since adolescence.

After several meetings, the Knapps and the Crowninshields gathered at the Salem Common at 8 p.m. on April 2 to finalize the plan. Richard, Joe confessed, had thoughtfully displayed the "tools" he planned to use for the project. Using his machinist's skills, he had manufactured one of the murder weapons—a club—himself. It was "two feet long, turned of hard wood . . . and ornamented . . . with beads at the end to keep it from slipping. . . . The dirk was about five inches long on the blade . . . sharp at both edges, and tapering to a point."

That same evening, after stealing what he believed to be the will, Joe Knapp "unbarred and unscrewed" a window in Captain White's house. Four days later, at 10 p.m., Richard

GRANGER COLLECTION, NEW YORK (2)

Crowninshield entered the front yard through the garden gate and climbed through the unlocked window to murder White.

The detailed confession pointed to Richard Crowninshield as the principal perpetrator of the deed: he would surely hang. But Richard learned from defense attorney Franklin Dexter that Massachusetts law did not allow the trial of an accessory to a crime unless the principal had first been tried and convicted. Richard must have seen a way to exercise his ingenuity one last time and perhaps save his brother and friends. On June 15, at 2 in the afternoon, a jailer found Richard's body hanging by its neck from two silk handkerchiefs tied to the bars of his cell window.

The Commonwealth of Massachusetts, it seemed, had been cheated out of an open-and-shut case, unless the state could find a legal basis for putting the other three men on trial. Newspaper reporters descended on Salem from as far away as New York City—ostensibly with the lofty goal of ensuring that justice be achieved. In the words of pioneering journalist James Gordon Bennett, then a correspondent for the *New York Courier*: "The press is the living jury of the Nation!"

THE PROSECUTION IN THE WHITE CASE faced a quandary. Not only was there no prior conviction of the principal (due to Richard Crowninshield's suicide), but Joe Knapp was refusing to testify and uphold his confession. So the prosecution turned to Senator Daniel Webster of Boston, the New Hampshire-born lawyer, lawmaker and future secretary of state, perhaps best remembered for his efforts to hammer out compromises between Northern and Southern states that he believed would forestall civil war.

Webster, then 48, had served several terms in the House of Representatives before being elected to the U.S. Senate in 1827. He was a close friend of such Salem area notables as Stephen White and Supreme Court Justice Joseph Story. Webster's commanding presence, his dramatic dark coloring and his relentless gaze had earned him the sobriquet "Black Dan." In the courtroom he was known to be fierce at cross-examination and riveting at summation—"the immortal Daniel," the *New Hampshire Patriot and States Gazette* had called him.

Asked by Stephen White to aid prosecutors at the murder trial, Webster was torn. Throughout his lengthy legal career, he had always stood for the defense. A large part of his reputation rested on his passionate oratory on behalf of the accused. Further, his personal connections with the victim's friends and relatives raised delicate issues of legal ethics.

On the other hand, if he stood by his friends, the favor would someday be repaid. Then there was the handsome fee of $1,000 that Stephen White had discreetly arranged for his services. Webster, a heavy drinker who had a tendency to spend beyond his means and was chronically in debt, agreed to "assist" the prosecution—which meant, of course, that he would lead it.

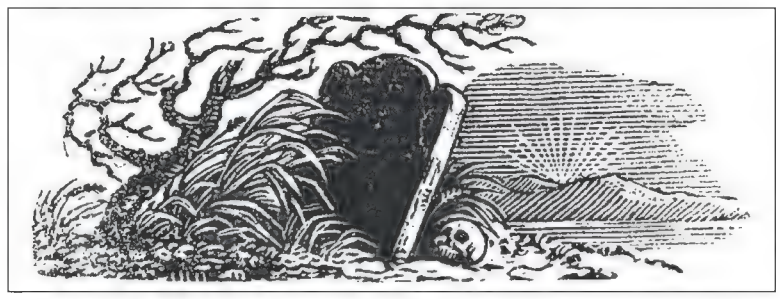
The accused men had chosen to be tried separately, and the first to come to trial, in August 1830, was Frank Knapp. Interest ran high. Bennett reported that the crowds trying to enter the courtroom to see Webster were "like the tide boiling up on the rocks." With Richard Crowninshield dead—"There is no refuge from confession but suicide, and suicide is confession," Webster famously said—Webster's intent was to establish Frank Knapp as a principal rather than an accessory. Several witnesses testified they had seen a man wearing a "camlet cloak" and a "glazed cap," such as Frank often wore, late on the night of the murder, on Brown Street, behind the White property. Webster argued that Frank was there to give direct aid to the murderer, and was therefore a prime actor. The defense challenged the witnesses' identification and scoffed that Frank's mere presence on Brown Street could have provided vital aid. The

Richard Crowninshield thought he would avoid the gallows—and might well have—had Joe Knapp not confessed his role in the plot to the Rev. Colman.

jury deliberated for 25 hours before announcing they were deadlocked. The judge declared a mistrial. The case was scheduled to be retried two days later.

THE SECOND TRIAL brought debate over the forensic evidence to the fore. In the first trial, only Dr. Johnson had testified. But this time the prosecution included the formal testimony of Dr. Peirson. His dissenting opinion on the autopsy—that there possibly had been two assailants—had been widely read in the *Salem Gazette*. Now Peirson was being used as an expert witness in an apparent attempt to cast doubt on the theory that Richard Crowninshield had acted alone in the lethal assault upon Joseph White. Webster speculated that Knapp might have delivered the "finishing stroke;" or that the other wounds had been inflicted "from mere wantonness." Knapp's defense attorney ridiculed the argument, wondering aloud why Knapp would return to the house to stab a dead body: "Like another Falstaff did he envy the perpetrator the glory of the deed and mean to claim it as his own?"

In the interim between the two trials, the new jury had been exposed to newspaper accounts of the first hearing, as well as to heavy criticism leveled at the previous jury for its failure to convict. Thus encouraged, the second jury listened intently as Webster captivated the courtroom with a dramatic re-creation of the crime: "A healthful old man, to whom sleep was sweet, the first sound slumbers of the night held him in their soft but strong embrace. The assassin enters, through the window already prepared . . . With noiseless foot he paces the lonely hall, half-lighted by the moon; he winds up the ascent of the stairs, and reaches the door of the chamber. Of this, he moves the lock, by soft and continued pressure, till it turns on its hinges without noise; and he enters, and beholds his victim before him. . . . "



A sketch of Frank Knapp's grave site (above) is from an 1830 book recounting the murder and trial. Knapp was hanged before a crowd of thousands at Salem Gaol.

Webster's summation was later deemed a masterpiece of oratory. "The terrible power of the speech and its main interest lie in the winding chain of evidence, link by link, coil by coil, round the murderer and his accomplices," British literary critic John Nichol wrote. "One seems to hear the bones of the victim crack under the grasp of a boa-constrictor." Samuel McCall, a prominent lawyer and statesman, called the speech "the greatest argument ever addressed to a jury."

After just five hours of deliberation the jury accepted Webster's contention that Frank Knapp was a principal to the crime and convicted him of murder.

"THE TOWN NOW BEGINS to grow rather more quiet than it has been since the murder of Mr. White," Nathaniel Hawthorne wrote in a letter to a cousin, "but I suppose the excitement will revive at the execution of Frank Knapp."

Hawthorne, a still-struggling, 26-year-old writer living in his mother's home in Salem, was riveted by the case. The son and grandson of respected sea captains, he was also a descendant of John Hathorne, one of the infamous hanging judges of the witchcraft trials. The family connection both fascinated and repelled the future novelist, and no doubt informed his lifelong interest in crime and inherited guilt. At the time of the Knapp trial, Hawthorne was writing short fiction for local papers, including the *Salem Gazette*, which covered the story assiduously. Some scholars have suggested that Hawthorne wrote some of the newspaper's unsigned articles about the murder, though there is no hard evidence to support that.

In letters, Hawthorne described the town's "universal prejudice" against the Knapp family and expressed his own ambivalence about the jury's verdict: "For my part, I wish Joe to be punished, but I should not be very sorry if Frank were to escape."

On September 28, 1830, before a crowd of thousands, Frank Knapp was hanged in front of Salem Gaol. His brother Joseph, tried and convicted in November, met the same fate three months later. George Crowninshield, the remaining conspirator, had spent the night of the murder with two ladies of the evening, who provided him with an alibi. After two trials he was acquitted by a now-exhausted court. The two men who had been in the company of George in the gambling house were discharged without trial.

By September 9, 1831, Hawthorne was writing to his cousin that, "The talk about Captain White's murder has almost entirely ceased." But echoes of the trial would reverberate in American literature.

Two decades later, Hawthorne found inspiration in the White murder in writing *The Scarlet Letter* (1850). Margaret Moore—the former secretary of the Nathaniel Hawthorne Society and the author of *The Salem World of Nathaniel Hawthorne*—argues that Webster's ruminations on the uncontrollable urge to confess influenced Hawthorne's portrayal of the Rev. Arthur Dimmesdale in *The Scarlet Letter*. Dimmesdale is tortured by the secret of being the lover of Hester Prynne—and when Hester hears Dimmesdale's final sermon, Hawthorne writes, she could detect "the complaint of the human heart, sorrow-laden, perchance guilty, telling its secret, whether of guilt or sorrow, to the great heart of mankind; beseeching its sympathy or forgiveness—at every moment—in each accent. . . . "

The late Harvard University literary scholar Francis Otto Matthiessen argued that echoes of the White murder and Webster's summation also found their way into *The House of Seven Gables* (1851). The opening chapter sets the gothic tone by describing the Pyncheon family's sordid history—the murder 30 years prior of the family patriarch, "an old bachelor and

TRIALS OF CAPT. JOSEPH J. KNAPP, JR. AND GEORGE CROWNINSHIELD, ESQ. FOR THE MURDER OF CAPT. JOSEPH WHITE, PUBLISHED BY CHARLES ELLMS, 1830, BOSTON

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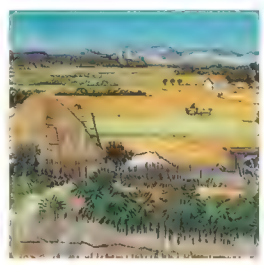

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Webster's summation was deemed a masterpiece of oratory: "One seems to hear the bones of the victim crack under the grasp of a boa-constrictor."

possessed of great wealth in addition to the house and real estate." Later in the novel, Hawthorne devotes 15 pages to an unnamed narrator who describes and taunts the corpse of the tyrannical Judge Pyncheon. Matthiessen saw Webster's influence particularly in the way Hawthorne used the imagery of moonlight: "Observe that silvery dance upon the upper branches of the pear-tree, and now a little lower, and now on the whole mass of boughs, while, through their shifting intricacies, the moonbeams fall aslant into the room. They play over the Judge's figure and show that he has not stirred throughout the hours of darkness. They follow the shadows, in changeful sport, across his unchanging features."

The White murder also left its mark on Edgar Allan Poe, who at the time of the crime was poised to enter the U.S. Military Academy at West Point (which he left after one year by deliberately getting court-martialed for disobedience). Nobody knows if Poe followed the trial as it occurred, but by 1843, when he published "The Tell-Tale Heart," he had clearly read about it. Poe scholar T. O. Mabbott has written that Poe relied critically on Webster's summation in writing the story. At the trial, Webster spoke of the murderer's "self-possession" and "utmost coolness." The perpetrator, he added, ultimately was driven to confession because he believed the "whole world" saw the crime in his face and the fatal secret "burst forth." Likewise, Poe's fictional murderer boasts of "how wisely" and "with what caution" he killed an old man in his bedchamber. But the perfect crime comes undone when Poe's murderer—convinced that the investigating police officers know his secret and are mocking him—declares, "I felt that I must scream or die! . . . I admit the deed!"

Webster's relentless gaze and commanding presence (above: in 1835) earned him the sobriquet "Black Dan."

THE SPELLBINDING SUMMATION Daniel Webster delivered at the trial was printed as part of an anthology of speeches later that year and sold to an admiring public. But Black Dan's political ambitions took a turn for the worse in 1850 when, belying his years of opposition to slavery, he gave an impassioned speech defending the new Fugitive Slave Act, which required Northern states to aid in the return of escaped slaves to their Southern masters. The legislation was part of a compromise that would allow California to be admitted to the Union as a "free state." But abolitionists perceived the speech as a betrayal and believed it to be an attempt by Webster to curry favor with the South in his bid to become the Whig Party's presidential candidate in 1852, and he lost the nomination. Webster died shortly thereafter from an injury resulting from a carriage accident. The autopsy revealed the cause of death to be a brain hemorrhage, complicated by cirrhosis of the liver.

For its part, Salem would become an important center of antislavery activism. Prior to Frederick Douglass' emergence as a national figure in the 1840s, Salem native Charles Lenox Remond was the most famous African-American abolitionist in the United States and Europe. His sister, Sarah Parker Remond, also lectured abroad, and often shared the podium with Susan B. Anthony at antislavery conventions.

Salemites would make every effort to put the White murder behind them. Even a century after the trial, the town was reluctant to speak of it. Caroline Howard King, whose memoir *When I Lived in Salem* appeared in 1937, destroyed the chapter about the crime before publication, judging it to be "indiscreet." In 1956, when Howard Bradley and James Winans published a book about Webster's role in the trial, they initially encountered resistance when conducting their research. "Some people in Salem preferred to suppress all reference to the case," Bradley and Winans wrote, and "there were still people who viewed inquiries about the murder with alarm."

Today, the Salem witch trials drive the town's tourist trade. But, every October, you can go on historian Jim McAllister's candlelight "Terror Trail" tour, which includes a stop at the scene of the crime, now known as the Gardner-Pingree House. You can also tour the inside of the house—a national historic landmark owned by the Peabody Essex Museum—which has been restored to its 1814 condition. The museum possesses—but doesn't exhibit—the custom-made club that served as the murder weapon.

I was allowed to inspect it, standing in a cavernous storage room wearing a pair of bright blue examination gloves. The club is gracefully designed and fits easily in the hand. I couldn't help but admire Richard Crowninshield's workmanship.

Share this story and read a history of the Salem witch trials at smith.hy.pr/salem

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A new exhibition spotlights the Apollo Theater's enduring role in American music and culture **BY LUCINDA MOORE**

Featuring the musical and comedic talents of African-American performers for decades, the landmark Harlem theater transformed popular entertainment (Tina Turner on stage in 1970). "It is an unmatched legacy," says historian Ted Fox.

One night in April 1935, a statuesque brunette stood backstage at the Apollo Theater in New York City. Aware that the theater's tough audience could make or break her career, she froze. A comedian named Pigmeat Markham shoved her onto the stage.

"I had a cheap white satin dress on and my knees were shaking so bad the people didn't know whether I was going to dance or sing," she would remember.

The ingénue was Billie Holiday.

She would perform at the Apollo two dozen times en route to becoming a music legend and one of the most influential vocalists in jazz.

For more than 75 years, entertainers—most of them African-American—have launched their careers, competed, honed their skills and nurtured one another's talent at the Apollo Theater. Along the way they have created innovations in music, dance and comedy that transcended race and, ultimately, transformed popular entertainment.

"You can basically trace any popular cultural form that we enjoy today back to the Apollo Theater as the place that did it first or did it best," says Ted Fox, author of the 1983 book *Showtime at the Apollo*. "It is an unmatched legacy."

The Harlem theater's groundbreaking role in 20th-century culture is the subject of "Ain't Nothing Like the Real Thing," an exhibition of photographs, recordings, movie footage and other memorabilia at Detroit's Charles H. Wright Museum of African American History until January 2, 2011. (It then moves to the Museum of the City of New York and the California African American Museum in Los Angeles.) The exhibition was organized by the Smithsonian's National Museum of African American History and Culture (NMAAHC) and the Apollo Theater Foundation.

The Apollo, previously a burlesque house for whites only, opened in 1934 to racially integrated audiences. Its reputation as a stage on which performers sweat to win the affection of a notoriously critical audience and an "executioner" shoos unpopular acts away can be traced to Ralph Cooper, the actor, radio host and longtime Apollo emcee. It was he who created the amateur-night contest, a Wednesday fixture and audience favorite that aired on local radio.

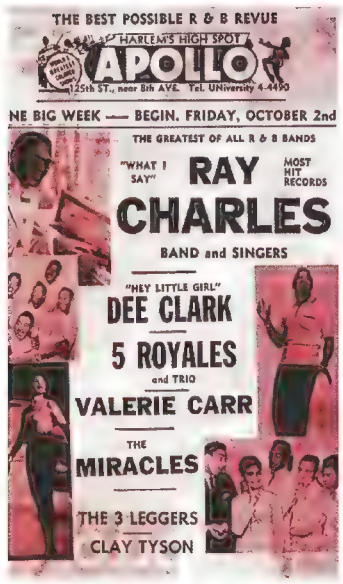
Frank Schiffman and Leo Brecher, who bought the theater in 1935, adopted a variety-show format; promoted the amateur-night contest, eventually heard on 21 radio stations; and spotlighted big bands. In May 1940, the *New York Amsterdam News* reported, the theater turned nearly 1,000 people away from a sold-out Count Basie show that the paper called "the greatest jam session in swing history."

"During its first 16 years of existence, the Apollo presented almost every notable African-American jazz band, singer, dancer and comedian of the era," co-curator Tuliza Fleming writes in the exhibition's companion book.

Shows featuring "Little Richard" Penniman, Chuck

LUCINDA MOORE *is an associate editor at* SMITHSONIAN.

GRANGER COLLECTION, NEW YORK; FRANK DRIGGS COLLECTION / HULTON ARCHIVE / GETTY IMAGES; GAB ARCHIVE / REDFERNS / GETTY IMAGES; BETTMANN / CORBIS; FRANK DRIGGS COLLECTION; P. 70 TIME & LIFE PICTURES / GETTY IMAGES; STEVE SCHAPIRO / CORBIS (INSET); P. 71 BOB ADELMAN / MAGNUM PHOTOS



"During its first 16 years of existence, the Apollo presented almost every notable African-American jazz band, singer, dancer and comedian of the era," writes co-curator Tuliza Fleming in a companion volume to "Ain't Nothing Like the Real Thing," an exhibition currently in Detroit (above: a placard from 1960). Clockwise from opposite top: Billie Holiday, c. 1950s (at an unidentified performance); James Brown, c. 1962; Ella Fitzgerald with a band led by drummer Chick Webb, 1937; unidentified participants in an amateur-night contest, c. 1952, a weekly competition that launched scores of entertainers' careers.

Berry and others in the mid-1950s helped shape rock 'n' roll. In a 1955 performance, Bo Diddley's rumba rhythms, driving guitar beat and swinging hips notably captivated one member of the audience: 20-year-old Elvis Presley. "That's how Elvis got his pelvis," Cooper recalled.

James Brown, the "Godfather of Soul," who said he first appeared at the Apollo in 1959, became a regular there and helped pioneer soul, funk and hip-hop music. "When he sang 'Please, Please, Please,' we all would faint," the singer Leslie Uggams, a frequent Apollo performer, tells SMITHSONIAN. "Then he'd drop to his knees and put that cape over his shoulders. You could feel the theater just pulsate."

The Apollo showcased top female artists such as Aretha Franklin, the "Queen of Soul," whose fame was so far-reaching Zulu chief Mangosuthu Gatsha Buthelezi, future founder of South Africa's Freedom Party, traveled to see her perform in 1971. Tina Turner, the "Queen of Rock 'n' Roll," says she first appeared at the Apollo in 1960 as part of the Ike and Tina Turner Revue. Wearing microscopic skirts and stiletto heels, she exuded raw sex appeal on stage long before Madonna and Beyoncé ever drew attention for risqué displays.

The theater was also a comedy laboratory. Richard Pryor, who first did stand-up there during the turbulent 1960s, used "the rage and frustrations of an era to spur his comic genius," says NMAAHC director Lonnie Bunch. "He ripped the scab off. He symbolized a freedom that allowed [other comedians] to tap sexuality, gender issues and economic foibles."

Hard times arrived in the mid-1970s as a local economic crisis and competition from large arenas such as Madison Square Garden thinned the Apollo's audience. The theater shut its doors in 1976. But in the 1980s, businessman Percy Sutton's Inner City Broadcasting Corporation bought it, renovated it, secured landmark status and revived amateur nights, which continue to sell out to this day.

This past June, the theater's Hall of Fame inducted Aretha Franklin and Michael Jackson, who first shot to stardom as the lead singer of the Jackson Five following the group's 1967 amateur-night victory. Jackson's last public performance in the United States was at a 2002 Democratic Party fund-raiser at the Apollo, where he sang his 1991 hit "Dangerous." When a spontaneous memorial sprang up outside the theater following Jackson's death in June 2009 at age 50, the Rev. Al Sharpton told the crowd, "He smashed the barriers of segregated music."

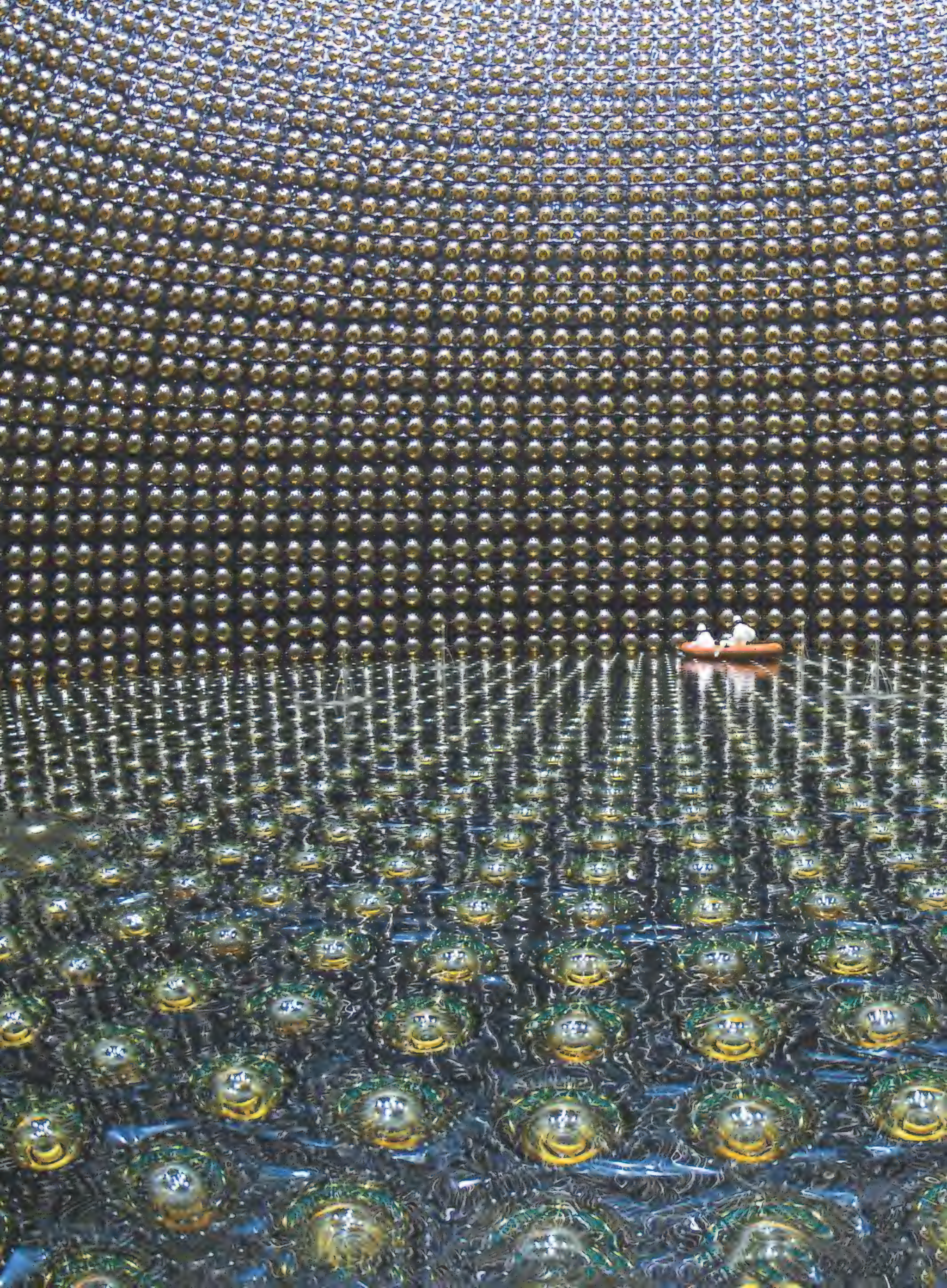
Many performers found mentors at the Apollo. Smokey Robinson recalls Ray Charles writing arrangements for the songs that Robinson and his group, the Miracles, sang at their 1958 Apollo debut. "Little Anthony" Gourdine, lead singer of the Imperials, recalls singer Sam Cooke writing lyrics for the group's hit "I'm Alright" in the theater basement.

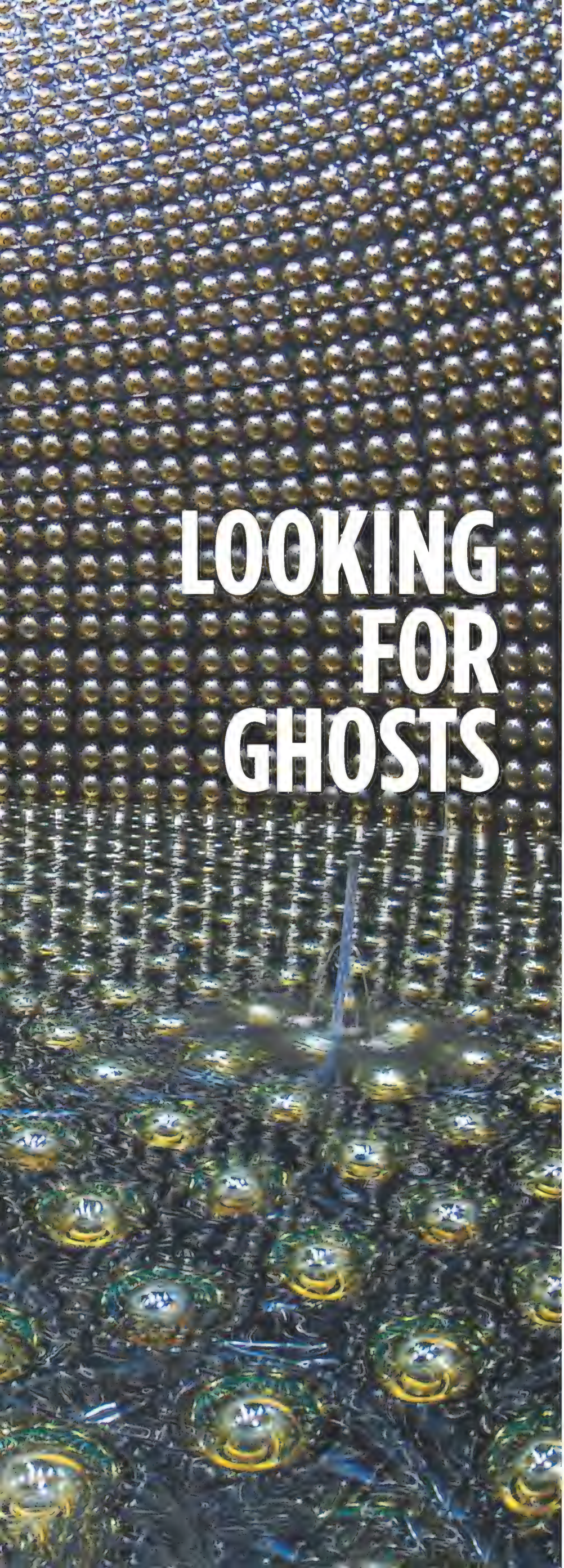
"It was a testing ground for artists," says Portia Maultsby, co-editor of the book *African American Music*. It was also, she says, "a second home, an institution within the community almost at the level of black churches."

See more from the Apollo and share this story at smith.hy.pr/apollo

BRUCE DAVIDSON / MAGNUM PHOTOS; EVAN AGOSTINI / GETTY IMAGES; MICHAEL OCHS ARCHIVES / GETTY IMAGES; ERIC SCHWAB / AFP / GETTY IMAGES

Michael Jackson (above: at the Apollo in 2002, his last public performance in the United States) shot to stardom as the lead singer of the Jackson Five following the group's amateur-night victory in 1967. "It was a testing ground for artists," says music scholar Portia Maultsby, and "a second home, an institution within the community almost at the level of black churches." Clockwise from left: Diana Ross backstage in 1965; Nat "King" Cole in his dressing room with wife Maria in 1950; the Four Tops rehearsing in the basement in 1964.





We're awash in neutrinos. They're among the lightest of the two dozen or so known subatomic particles and they come from all directions: from the Big Bang that began the universe, from exploding stars and, most of all, from the sun. They come straight through the earth at nearly the speed of light, all the time, day and night, in enormous numbers. About 100 trillion neutrinos pass through our bodies every second.

The problem for physicists is that neutrinos are impossible to see and difficult to detect. Any instrument designed to do so may feel solid to the touch, but to neutrinos, even stainless steel is mostly empty space, as wide open as a solar system is to a comet. What's more, neutrinos, unlike most subatomic particles, have no electric charge—they're neutral, hence the name—so scientists

To track neutrinos, some of the most elusive particles in nature, scientists go to the ends of the earth to conduct experiments in abandoned mines and Antarctic ice

BY ANN FINKBEINER

can't use electric or magnetic forces to capture them. Physicists call them "ghost particles."

To capture these elusive entities, physicists have conducted some extraordinarily ambitious experiments. So that neutrinos aren't confused with cosmic rays (subatomic particles from outer space that do not penetrate the earth), detectors are installed deep underground. Enormous ones have been placed in gold and nickel mines, in tunnels beneath mountains, in the ocean and in Antarctic ice. These strangely beautiful devices are monuments to humankind's resolve to learn about the universe.

It's unclear what practical applications will come from studying neutrinos. "We don't know where it's going to lead," says Boris Kayser, a theoretical physicist at Fermilab in Batavia, Illinois.

Physicists study neutrinos in part because neutrinos are such odd characters: they seem to break the rules that describe nature at its most fundamental. And if physicists are ever going to fulfill their hopes of developing a coherent theory of reality that explains the basics of nature without exception, they are going to have to account for the behavior of neutrinos.

The cavernous Super-Kamiokande detector in Japan is lined with 13,000 sensors to pinpoint signs of neutrinos (workers in a boat monitor the device as it fills with water).

In addition, neutrinos intrigue scientists because the particles are messengers from the outer reaches of the universe, created by violently exploding galaxies and other mysterious phenomena. "Neutrinos may be able to tell us things that the more humdrum particles can't," says Kayser.

Physicists imagined neutrinos long before they ever found any. In 1930, they created the concept to balance an equation that was not adding up. When the nucleus of a radioactive atom disintegrates, the energy of the particles it emits must equal the energy it originally contained. But in fact, scientists observed, the nucleus was losing more energy than detectors were picking up. So to account for that extra energy the physicist Wolfgang Pauli conceived an extra, invisible particle emitted by the nucleus. "I have done something very bad today by proposing a particle that cannot be detected," Pauli wrote in his journal. "It is something no theorist should ever do."

Experimentalists began looking for it anyway. At a nuclear weapons laboratory in South Carolina in the mid-1950s, they stationed two large water tanks outside a nuclear reactor that, according to their equations, should have been making ten trillion neutrinos a second. The detector was tiny by today's standards, but it still managed to spot neutrinos—three an hour. The scientists had established that the proposed neutrino was in fact real; study of the elusive particle accelerated.

A decade later, the field scaled up when another group of physicists installed a detector in the Homestake gold mine, in Lead, South Dakota, 4,850 feet underground. In this experiment the scientists set out to observe neutrinos by monitoring what happens on the rare occasion when a neutrino collides with a chlorine atom and creates radioactive argon, which is readily detectable. At the core of the experiment was a tank filled with 600 tons of a chlorine-rich liquid, perchloroethylene, a fluid used in dry-cleaning. Every few months, the scientists would flush the tank and extract about 15 argon atoms, evidence of 15 neutrinos. The monitoring continued for more than 30 years.

Canada's Sudbury Neutrino Observatory (opposite top) confirmed that a neutrino can change its identity. Physicists at Brookhaven National Laboratory in New York (opposite bottom: the lab's STAR detector) hope to shoot a neutrino beam underground to the Homestake mine in South Dakota.

Hoping to detect neutrinos in larger numbers, scientists in Japan led an experiment 3,300 feet underground in a zinc mine. Super-Kamiokande, or Super-K as it is known, began operating in 1996. The detector consists of 50,000 tons of water in a domed tank whose walls are covered with 13,000 light sensors. The sensors detect the occasional blue flash (too faint for our eyes to see) made when a neutrino collides with an atom in the water and creates an electron. And by tracing the exact path the electron traveled in the water, physicists could infer the source, in space, of the colliding neutrino. Most, they found, came from the sun. The measurements were sufficiently sensitive that Super-K could track the sun's path across the sky and, from nearly a mile below the surface of the earth, watch day turn into night. "It's really an exciting thing," says Janet Conrad, a physicist at the Massachusetts Institute of Technology. The particle tracks can be compiled to create "a beautiful image, the picture of the sun in neutrinos."

But the Homestake and Super-K experiments didn't detect as many neutrinos as physicists expected. Research at the Sudbury Neutrino Observatory (SNO, pronounced "snow") determined why. Installed in a 6,800-foot-deep nickel mine in Ontario, SNO contains 1,100 tons of "heavy water," which has an unusual form of hydrogen that reacts relatively easily with neutrinos. The fluid is in a tank suspended inside a huge acrylic ball that is itself held inside

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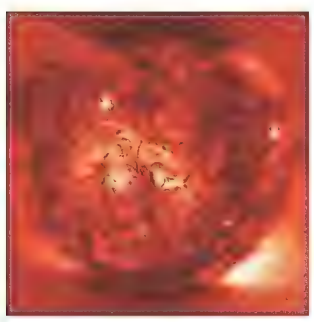
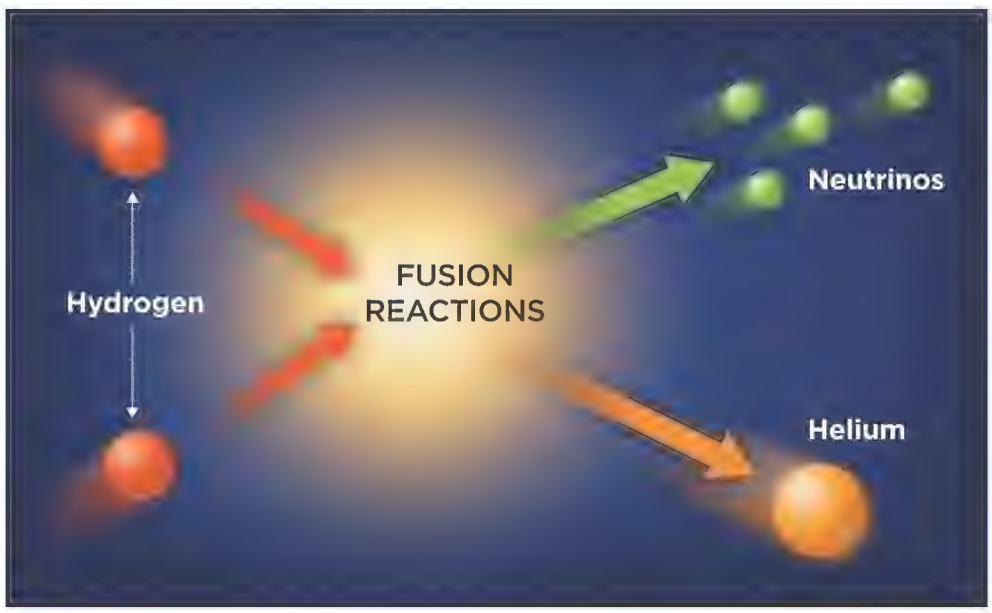
ANN FINKBEINER's *latest book,* A Grand and Bold Thing, *is about the Sloan Digital Sky Survey, an effort to map the universe.*

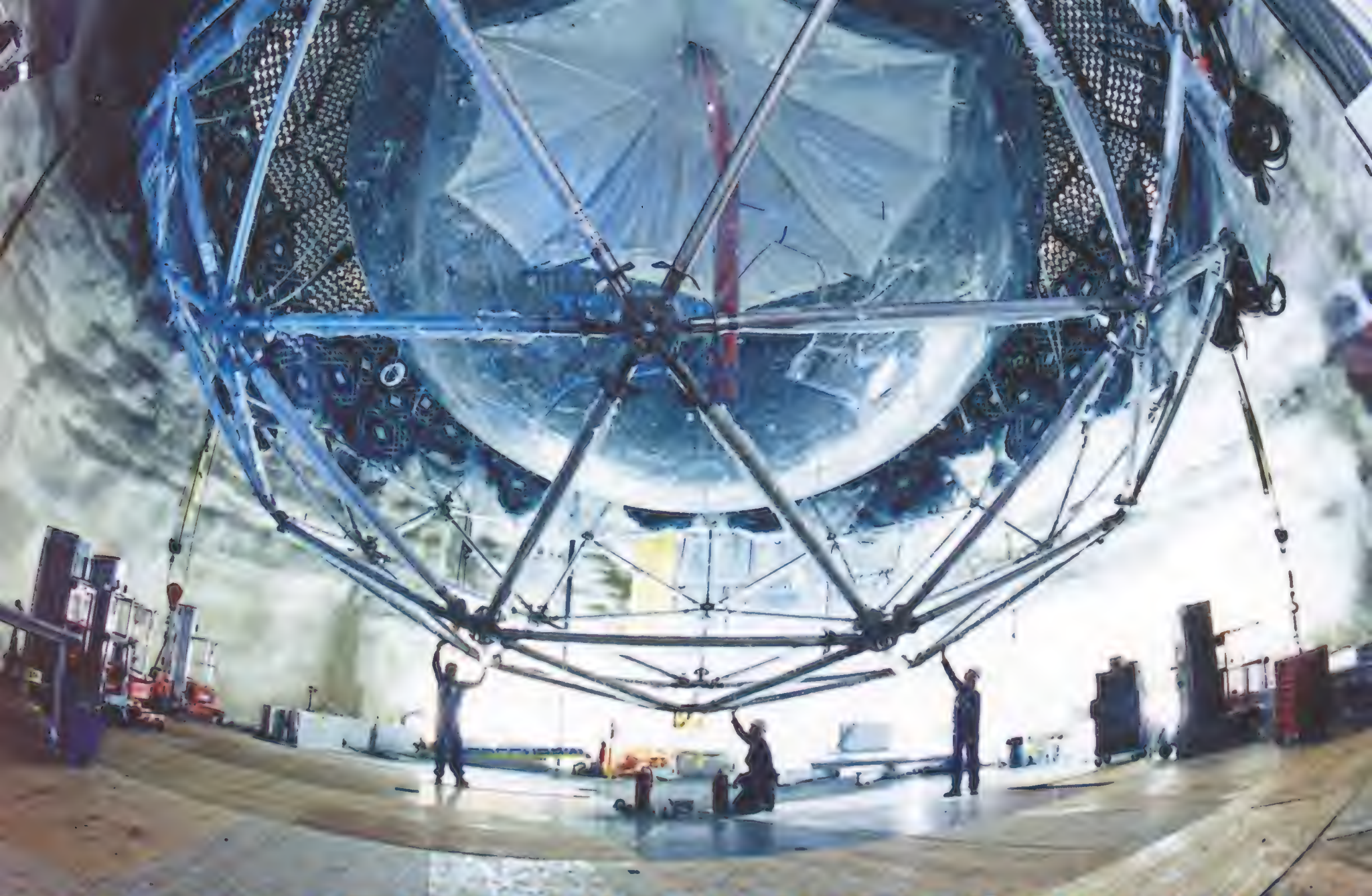
THE ORIGINS OF A ONCE-IMAGINARY PARTICLE

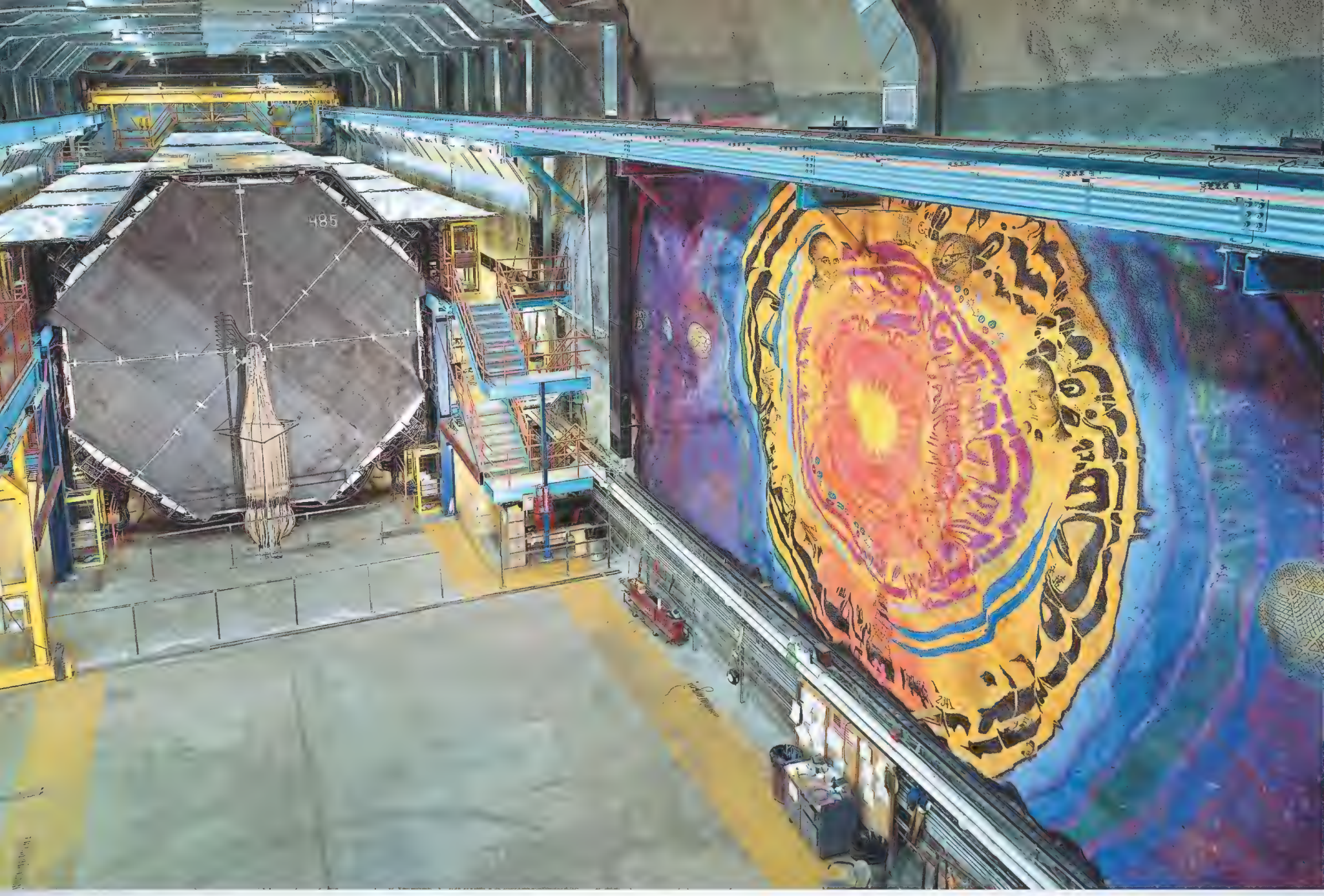


Most of the neutrinos that bombard us come from the sun (left: an ultraviolet image). In a series of reactions at the sun's core (right), hydrogen atoms create helium through fusion. The process releases energy and subatomic particles, including neutrinos. When a photon, or particle of light, leaves the sun's dense core, it gets trapped in the heat and fury and may not reach us for millions of years. But a solar neutrino is undeterred and reaches earth in eight minutes.



NASA; ILLUSTRATION: SAMUEL VELSASCO / 5W INFOGRAPHICS; P. 79 SNO; BNL; PP. 76-77 KAMIOKA OBSERVATORY, ICRR (INSTITUTE FOR COSMIC RAY RESEARCH), THE UNIVERSITY OF TOKYO

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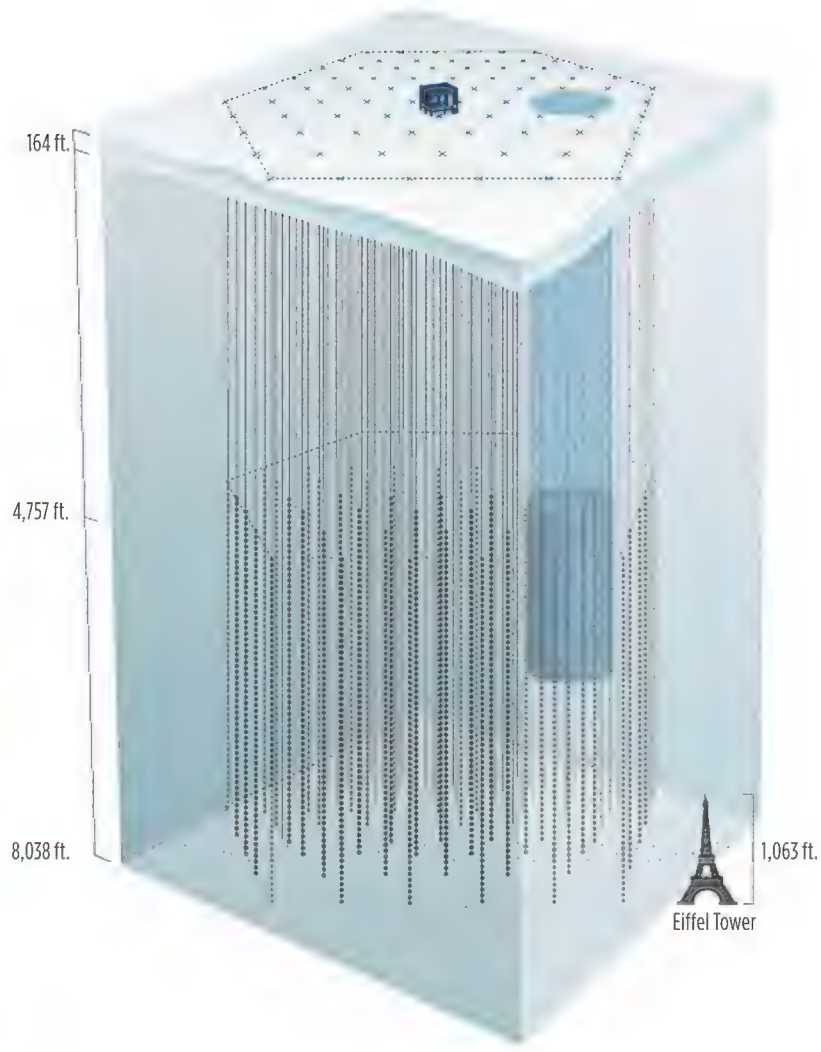
The IceCube neutrino detector in Antarctica (right: a diagram) is embedded in the ice (below: a string of sensors descends into an 8,000-foot-deep hole). With 5,000 sensors attached to more than 70 lines, IceCube will look for neutrinos that have passed 8,000 miles through the planet.



a geodesic superstructure, which absorbs vibrations and on which are hung 9,456 light sensors—the whole thing looking like a 30-foot-tall Christmas tree ornament.

Scientists working at SNO discovered in 2001 that a neutrino can spontaneously switch among three different identities—or as physicists say, it oscillates among three flavors. The discovery had startling implications. For one thing, it showed that previous experiments had detected far fewer neutrinos than predicted because the instruments were tuned to just one neutrino flavor—the kind that creates an electron—and were missing the ones that switched. For another, the finding toppled physicists' belief that a neutrino, like a photon, has no mass. (Oscillating among flavors is something that only particles with mass are able to do.)

How much mass do neutrinos have? To find out, physicists are building KATRIN—the Karlsruhe Tritium Neutrino Experiment. KATRIN's business end boasts a 200-ton device called a spectrometer that will measure the mass of atoms before and after they decay radioactively—thereby revealing how much mass the neutrino carries off. Technicians built the spectrometer about 250 miles from Karlsruhe, Germany, where the experiment will operate; the device was too large for the region's narrow roads, so it was put on a boat on the Danube River and floated past Vienna, Budapest and Belgrade, into the Black Sea, through the Aegean and the Mediterranean, around Spain, through the English Channel, to Rotterdam and into the Rhine, then south to the river port of Leopoldshafen, Germany. There it was offloaded onto a truck and squeaked through town to its destination, two months and 5,600 miles later. It is scheduled to start collecting data in 2012.

Physicists and astronomers interested in the information that neutrinos from outer space might carry about supernovas or colliding galaxies have set up neutrino "telescopes." One, called IceCube, is inside an ice field in Antarctica. When completed, in 2011, it will consist of more than 5,000 blue-light sensors (see diagram above). The sensors are aimed not at the sky, as you might expect, but toward the ground, to detect neutrinos from the sun and outer space that are coming through the planet from the north. The earth blocks cosmic rays, but most neutrinos zip through the 8,000-mile-wide planet as if it weren't there.

A long-distance neutrino experiment is taking place under several Midwestern states. A high-energy accelerator, which generates subatomic particles, shoots beams of neutrinos and related particles as much as six miles deep, beneath northern Illinois, across Wisconsin and into Minnesota. The particles start at Fermilab, as part of an experiment called the Main Injector Neutrino Oscillation Search (MINOS). In less than three-thousandths of a second, they hit a detector in the Soudan iron mine, 450 miles away. The data the scientists have gathered complicates their picture of this infinitesimal world: it now appears that exotic forms of neutrinos, so-called anti-neutrinos, may not follow the same rules of oscillation as other neutrinos.

"What's cool," says Conrad, "is that it's not what we expected."

When it comes to neutrinos, very little is.

The MINOS neutrino detector in Minnesota (opposite top: next to a mural in an iron mine) is the target of beams of neutrinos shot from Illinois. The KATRIN spectrometer (opposite bottom), which will measure the neutrino's mass, squeezed through Leopoldshafen, Germany, en route to a lab.

JIM HAUGEN / NATIONAL SCIENCE FOUNDATION; ILLUSTRATION: UNIVERSITY OF WISCONSIN-MADISON; P. 81 FERMILAB VISUAL MEDIA SERVICES; KARLSRUHE INSTITUTE OF TECHNOLOGY

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HOW LITTLE BIG

EDITOR'S NOTE: *In 1874, an Army expedition led by Lt. Col. George Armstrong Custer found gold in the Black Hills, in present-day South Dakota. At the time, the United States recognized the hills as property of the Sioux Nation, under a treaty the two parties had signed six years before. The Grant administration tried to buy the hills, but the Sioux, considering them sacred ground, refused to sell; in 1876, federal troops were dispatched to force the Sioux onto reservations and pacify the Great Plains. That June, Custer attacked an encampment of Sioux, Cheyenne and Arapaho on the Little Bighorn River, in what is now Montana.*

The Battle of the Little Bighorn is one of the most studied actions in U.S. military history, and the immense literature on the subject is devoted primarily to answering questions about Custer's generalship during the fighting. But neither he nor the 209 men in his immediate command survived the day, and an Indian counterattack would pin down seven companies of their fellow 7th Cavalrymen on a hilltop over four miles away. (Of about 400 soldiers on the hilltop, 53 were killed and 60 were wounded before the Indians ended their siege the next day.) The experience of Custer and his men can be reconstructed only by inference.

This is not true of the Indian version of the battle. Long-neglected accounts given by more than 50 Indian participants or witnesses provide a means of tracking the fight from the first warning to the killing of the last of Custer's troopers—a period of about two hours and 15 minutes. In his new book, The Killing of Crazy Horse, *veteran reporter Thomas Powers draws on these accounts to present a comprehensive narrative account of the battle as the Indians experienced it. Crazy Horse's stunning victory over Custer, which both angered and frightened the Army, led to the killing of the chief a year later. "My purpose in telling the story as I did," Powers says, "was to let the Indians describe what happened, and to identify the moment when Custer's men disintegrated as a fighting unit and their defeat became inevitable."*

The sun was just cracking over the horizon that Sunday, June 25, 1876, as men and boys began taking the horses out to graze. First light was also the time for the women to poke up last night's cooking fire. The Hunkpapa woman known as Good White Buffalo Woman said later she had often been in camps when war was in the air, but this day was not like that. "The Sioux that morning had no thought of fighting," she said. "We expected no attack."

Those who saw the assembled encampment said they had never seen one larger. It had come together in March or April, even before the plains started to green up, according to the Oglala warrior He Dog. Indians arriving from distant reservations on the Missouri River had reported that soldiers were coming out to fight, so the various camps made a point of keeping close together. There were at least six, perhaps seven, cheek by jowl, with the Cheyennes at the northern, or downriver, end near the broad ford where

On the day of the battle, 6,000 to 7,000 Indians were camped on the flats beside the Little Bighorn River (opposite). Crazy Horse (above: in a pictograph by fellow Oglala Sioux Amos Bad Heart Bull) led two decisive counterattacks against U.S. troops.

AMOS BAD HEART BULL / GRANGER COLLECTION, NEW YORK

HORN WAS WON

STANDARD ACCOUNTS OF THE 1876 BATTLE HAVE FOCUSED ON CUSTER'S ILL-FATED 7TH CAVALRY. NOW A NEW BOOK OFFERS A BLOW-BY-BLOW NARRATIVE FROM THE INDIANS' POINT OF VIEW

BY THOMAS POWERS PHOTOGRAPHS BY AARON HUEY

Indian elders reacted slowly to word that soldiers were on the way—"We sat there smoking," one of them would recall. But their warriors quickly halted the soldiers' initial attack and drove them across the river (above: a pictograph by Amos Bad Heart Bull).

Medicine Tail Coulee and Muskrat Creek emptied into the Little Bighorn River. Among the Sioux, the Hunkpapas were at the southern end. Between them along the river's bends and loops were the Sans Arc, Brulé, Minneconjou, Santee and Oglala. Some said the Oglala were the biggest group, the Hunkpapa next, with perhaps 700 lodges between them. The other circles might have totaled 500 to 600 lodges. That would suggest as many as 6,000 to 7,000 people in all, a third of them men or boys of fighting age. Confusing the question of numbers was the constant arrival and departure of people from the reservations. Those travelers—plus hunters from the camps, women out gathering roots and herbs and seekers of lost horses—were part of an informal early-warning system.

There were many late risers this morning because dances the previous night had ended only at first light. One very large tent near the center of the village—probably two lodges raised side by side—was filled with the elders, called chiefs by the whites but "short hairs," "silent eaters" or "big bellies" by the Indians. As the morning turned hot and sultry, large numbers of adults and children went swimming in the river. The water would have been cold; Black Elk, the future Oglala holy man, then 12, would remember that the river was high with snowmelt from the mountains.

It was approaching midafternoon when a report arrived that U.S. troops had been spotted approaching the camp. "We could hardly believe that soldiers were so near," the Oglala elder Runs the Enemy said later. It made no sense to him or the other men in the big lodge. For one thing, whites never attacked in the middle of the day. For several moments more, Runs the Enemy recalled, "We sat there smoking."

Other reports followed. White Bull, a Minneconjou, was watching over horses near camp when scouts rode down from Ash Creek with news that soldiers had shot and killed an Indian boy at the fork of the creek two or three miles back. Women who had been digging turnips across the river some miles to the east "came riding in all out of breath and reported that soldiers were coming," said the Oglala chief Thunder Bear. "The country, they said, looked as if filled with smoke, so much dust was there." The soldiers had shot and killed one of the women. Fast Horn, an Oglala, came in to say he had been shot at by soldiers he saw near the high divide on the way over into the Rosebud valley.

But the first warning to bring warriors on the run probably occurred at the Hunkpapa camp around 3 o'clock, when some horse raiders—Arikara (or Ree) Indians working for the soldiers, as it turned out—were seen making a dash for animals grazing in a ravine not far from the camp. Within moments shooting could be heard at the south end of camp. Peace quickly gave way to pandemonium—shouts and cries of women and children, men calling for horses or guns, boys sent to find mothers or sisters, swimmers rushing from the

Adapted from *The Killing of Crazy Horse*, by Thomas Powers.
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AMOS BAD HEART BULL / STAPLETON COLLECTION / BRIDGEMAN ART LIBRARY INTERNATIONAL

Steep bluffs delayed Lieutenant Colonel Custer's attempt to cross the river and attack the Indian camp from the north, allowing Indian warriors to surround his troops. The U.S. commander "began to suspect he was in a bad scrape," chief Gall would recall.

river, men trying to organize resistance, looking to their weapons, painting themselves or tying up their horses' tails.

As warriors rushed out to confront the horse thieves, people at the southernmost end of the Hunkpapa camp were shouting alarm at the sight of approaching soldiers, first glimpsed in a line on horseback a mile or two away. By 10 or 15 minutes past 3 o'clock, Indians had boiled out of the lodges to meet them. Now came the first shots heard back at the council lodge, convincing Runs the Enemy to put his pipe aside at last. "Bullets sounded like hail on tepees and tree tops," said Little Soldier, a Hunkpapa warrior. The family of chief Gall—two wives and their three children—were shot to death near their lodge at the edge of the camp.

But now the Indians were rushing out and shooting back, making show enough to check the attack. The whites dismounted. Every fourth man took the reins of three other horses and led them along with his own into the trees near the river. The other soldiers deployed in a skirmish line of perhaps 100 men. It was all happening very quickly.

As the Indians came out to meet the skirmish line, straight ahead, the river was to their left, obscured by thick timber and undergrowth. To the right was open prairie rising away to the west, and beyond the end of the line, a force of mounted Indians rapidly accumulated. These warriors were swinging wide, swooping around the end of the line. Some of the Indians, He Dog and Brave Heart among them, rode out still farther, circling a small hill behind the soldiers.

By then the soldiers had begun to bend back around to face the Indians behind them. In effect the line had halted; firing was heavy and rapid, but the Indians racing their ponies were hard to hit. Ever-growing numbers of men were rushing out to meet the soldiers while women and children fled. No more than 15 or 20 minutes into the fight the Indians were gaining control of the field; the soldiers were pulling back into the trees that lined the river.

THE PATTERN OF the Battle of the Little Bighorn was already established—moments of intense fighting, rapid movement, close engagement with men falling dead or wounded, followed by sudden relative quiet as the two sides organized, took stock and prepared for the next clash. As the soldiers disappeared into the trees, Indians by ones and twos cautiously went in after them while others gathered nearby. Shooting fell away but never halted.

Two large movements were unfolding simultaneously—most of the women and children were moving north down the river, leaving the Hunkpapa camp behind, while a growing stream of men passed them on the way to the fighting—"where the excitement was going on," said Eagle Elk, a friend of Red Feather, Crazy Horse's brother-in-law. Crazy

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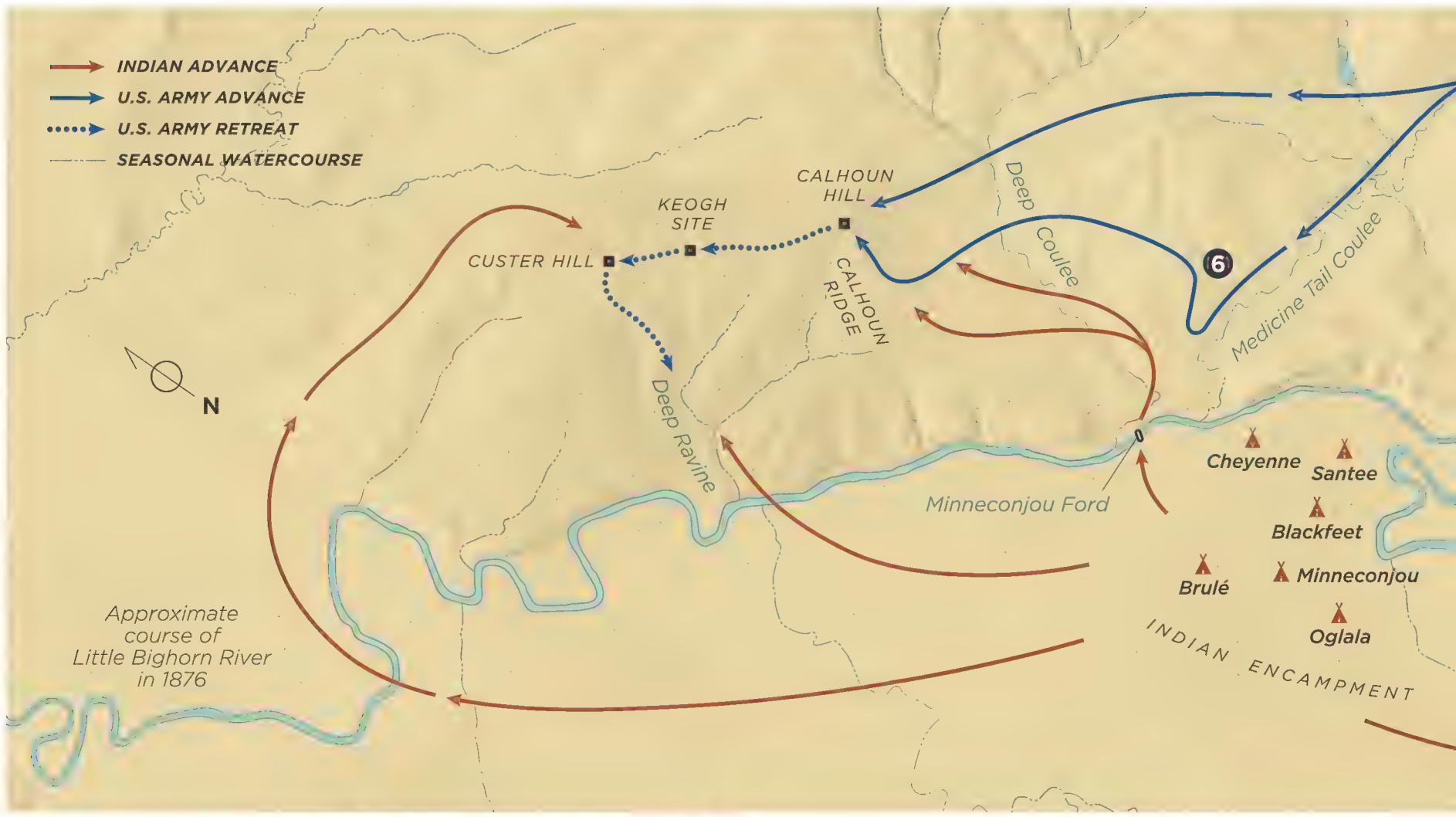
THOMAS POWERS *is the author of eight previous books.*
AARON HUEY *has spent six years documenting life among the Oglala Sioux on the Pine Ridge Reservation in South Dakota.*

FATEFUL AFTERNOON A chronology of the Little



1

JUST BEFORE 3:00 P.M.

Indians raise the alarm at the sight of approaching soldiers. A detachment of soldiers led by Maj. Marcus A. Reno attacks the Indians' encampment.

2

ABOUT 3:05

Indians sight a second group of soldiers riding north—Lt. Col. George Armstrong Custer's command.

3

ABOUT 3:15

Indians check the advance of Reno's soldiers and flank their left. Indians also see Custer's soldiers on what will become known as Reno Hill.

4

ABOUT 3:30

Reno's soldiers begin their retreat into the trees lining the river. Indians see Custer's soldiers on the bluff that will later be known as Weir Point.

Horse himself, already renowned among the Oglala for his battle prowess, was approaching the scene of the fighting at about the same time.

Crazy Horse had been swimming in the river with his friend Yellow Nose when they heard shots. Moments later, horseless, he met Red Feather bridling his pony. "Take any horse," said Red Feather as he prepared to dash off, but Crazy Horse waited for his own mount. Red Feather didn't see him again until 10 or 15 minutes later, when the Indians had gathered in force near the woods where the soldiers had taken refuge.

It was probably during those minutes that Crazy Horse had prepared himself for war. In the emergency of the moment many men grabbed their weapons and ran toward the shooting, but not all. War was too dangerous to treat casually; a man wanted to be properly dressed and painted before charging the enemy. Without his medicine and time for a prayer or song, he would be weak. A 17-year-old Oglala named Standing Bear reported that after the first warnings Crazy Horse had called on a *wicasa wakan* (medicine man) to invoke the spirits and then took so much time over his preparations "that many of his warriors became impatient."

Ten young men who had sworn to follow Crazy Horse "anywhere in battle" were standing nearby. He dusted himself and his companions with a fistful of dry earth gathered up from a hill left by a mole or gopher, a young Oglala named Spider would recall. Into his hair Crazy Horse wove some long stems of grass, according to Spider. Then he opened the medicine bag he carried about his neck, took from it a pinch of stuff "and burned it as a sacrifice upon a fire of buffalo chips which another warrior had prepared." The wisp of smoke, he believed, carried his prayer to the heavens. (Others reported that Crazy Horse painted his face with hail spots and dusted his horse with the dry earth.) Now, according to Spider and Standing Bear, he was ready to fight.

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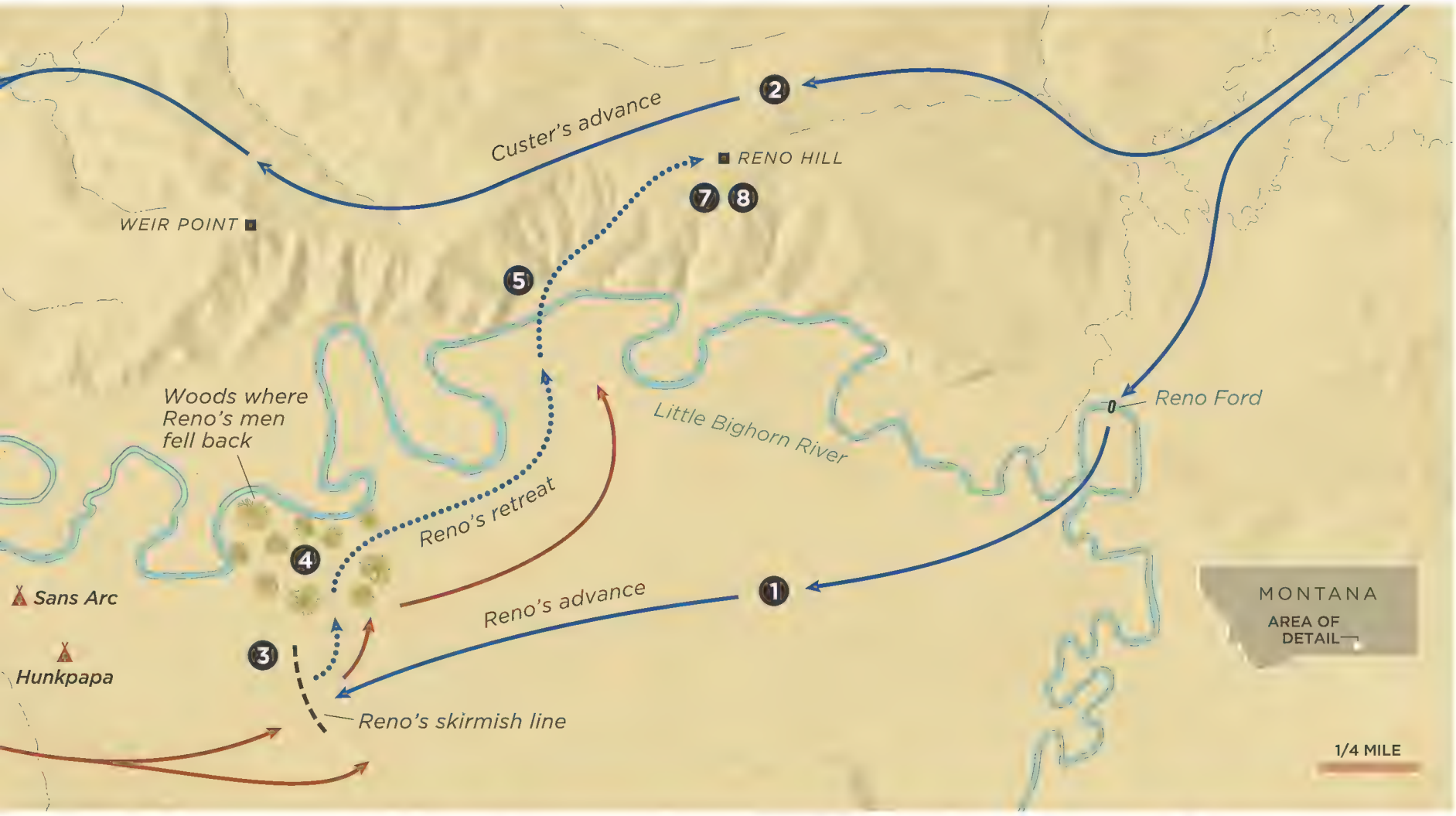
Bighorn battle, with times established by soldiers' testimony



MAP: GUILBERT GATES

5

ABOUT 4:00

Reno's soldiers are forced across the river and up Reno Hill. Indians see Custer's soldiers in Medicine Tail Coulee.

6

ABOUT 4:15

The soldiers go back up Medicine Tail Coulee. As Indians advance, a battle ensues: Calhoun Ridge to Calhoun Hill to the Keogh site and to Custer Hill.

7

ABOUT 4:25

Soldiers on Reno Hill hear the onset of heavy firing as fighting intensifies on the approach to Custer Hill.

8

BEFORE 5:15

Soldiers on Reno Hill hear the last volley of heavy firing from the Custer battle.

By the time Crazy Horse caught up with his cousin Kicking Bear and Red Feather, it was hard to see the soldiers in the woods, but there was a lot of shooting; bullets clattered through tree limbs and sent leaves fluttering to the ground. Several Indians had already been killed, and others were wounded. There was shouting and singing; some women who had stayed behind were calling out the high-pitched, ululating cry called the tremolo. Iron Hawk, a leading man of Crazy Horse's band of Oglala, said his aunt was urging on the arriving warriors with a song:

Brothers-in-law, now your friends have come.
Take courage.
Would you see me taken captive?

At just this moment someone near the timber cried out, "Crazy Horse is coming!" From the Indians circling around behind the soldiers came the charge word—*"Hokahey!"* Many Indians near the woods said that Crazy Horse repeatedly raced his pony past the soldiers, drawing their fire—an act of daring sometimes called a brave run. Red Feather remembered that "some Indian shouted, 'Give way; let the soldiers out. We can't get at them in there.' Soon the soldiers came out and tried to go to the river." As they bolted out of the woods, Crazy Horse called to the men near him: "Here are some of the soldiers after us again. Do your best, and let us kill them all off today, that they may not trouble us anymore. All ready! Charge!"

Crazy Horse and all the rest now raced their horses directly into the soldiers. "Right among them we rode," said Thunder Bear, "shooting them down as in a buffalo drive." Horses were shot and soldiers tumbled to the ground; a few managed to pull up behind friends, but on foot most were quickly killed. "All mixed up," said the Cheyenne Two Moons of the melee. "Sioux, then soldiers, then more Sioux, and all shoot-

Custer's soldiers never made it across the river. "We circled all round them, swirling like water round a stone," the warrior Two Moons said. A series of short, sharp fights left Custer and all 209 of his men dead, including his brothers Thomas and Boston.

ing." Flying Hawk, an Oglala, said it was hard to know exactly what was happening: "The dust was thick and we could hardly see. We got right among the soldiers and killed a lot with our bows and arrows and tomahawks. Crazy Horse was ahead of all, and he killed a lot of them with his war club."

Two Moons said he saw soldiers "drop into the river-bed like buffalo fleeing." The Minneconjou warrior Red Horse said several troops drowned. Many of the Indians charged across the river after the soldiers and chased them as they raced up the bluffs toward a hill (now known as Reno Hill, for the major who led the soldiers). White Eagle, the son of Oglala chief Horned Horse, was killed in the chase. A soldier stopped just long enough to scalp him—one quick circle-cut with a sharp knife, then a yank on a fistful of hair to rip the skin loose.

The whites had the worst of it. More than 30 were killed before they reached the top of the hill and dismounted to make a stand. Among the bodies of men and horses left on the flat by the river below were two wounded Ree scouts. The Oglala Red Hawk said later that "the Indians [who found the scouts] said these Indians wanted to die—that was what they were scouting with the soldiers for; so they killed them and scalped them."

The soldiers' crossing of the river brought a second breathing spell in the fight. Some of the Indians chased them to the top of the hill, but many others, like Black Elk, lingered to pick up guns and ammunition, to pull the clothes off dead soldiers or to catch runaway horses. Crazy Horse promptly turned back with his men toward the center of the great camp. The only Indian to offer an explanation of his abrupt withdrawal was Gall, who speculated that Crazy Horse and Crow King, a leading man of the Hunkpapa, feared a second attack on the camp from some point north. Gall said they had seen soldiers heading that way along the bluffs on the opposite bank.

THE FIGHT ALONG THE RIVER FLAT—from the first sighting of soldiers riding toward the Hunkpapa camp until the last of them crossed the river and made their way to the top of the hill—had lasted about an hour. During that time, a second group of soldiers had shown itself at least three times on the eastern heights above the river. The first sighting came only a minute or two after the first group began to ride toward the Hunkpapa camp—about five minutes past 3. Ten minutes later, just before the first group formed a skirmish line, the second group was sighted across the river again, this time on the very hill where the first group would take shelter after their mad retreat across the river. At about half-past 3, the second group was seen yet again on a high point above the river not quite halfway between Reno Hill and the Cheyenne village at the northern end of the big camp. By then the first group was retreating into the timber. It is likely that the second group of soldiers got their first clear view of the long sprawl of the Indian camp from this high bluff, later called Weir Point.

The Yanktonais White Thunder said he saw the second group make a move toward the river south of the ford by the Cheyenne camp, then turn back on reaching "a steep cut bank which they could not get down." While the soldiers retraced their steps, White Thunder and some of his friends went east up and over the high ground to the other

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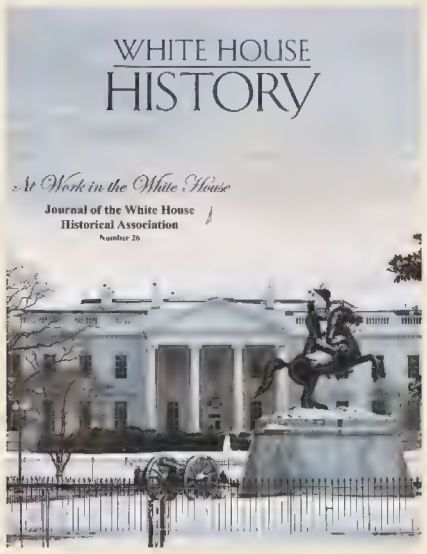

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side, where they were soon joined by many other Indians. In effect, White Thunder said, the second group of soldiers had been surrounded even before they began to fight.

From the spot where the first group of soldiers retreated across the river to the next crossing place at the northern end of the big camp was about three miles—roughly a 20-minute ride. Between the two crossings steep bluffs blocked much of the river's eastern bank, but just beyond the Cheyenne camp was an open stretch of several hundred yards, which later was called Minneconjou Ford. It was here, Indians say, that the second group of soldiers came closest to the river and to the Indian camp. By most Indian accounts it wasn't very close.

than that—several hundred yards back up the coulee. Most of the soldiers were still farther back up the hill. Some soldiers fired into the Indian camp, which was almost deserted. The few Indians at Minneconjou Ford fired back.

The earlier pattern repeated itself. Little stood in the soldiers' way at first, but within moments more Indians began to arrive, and they kept coming—some crossing the river, others riding up from the south on the east side of the river. By the time 15 or 20 Indians had gathered near the ford, the soldiers had hesitated, then begun to ride up out of Medicine Tail Coulee, heading toward high ground, where they were joined by the rest of Custer's command.

Among the U.S. soldiers (from left), Capt. Myles Keogh died with Custer; Maj. Marcus Reno, whose men made the initial attack, survived a siege on the hill that now bears his name. Among the Indians (from left), chief Gall lost his family—two wives and three children—early in the battle; Black Elk, only 12 at the time, and Iron Hawk were witnesses to the grisly end of the fighting.

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Approaching the ford at an angle from the high ground to the southeast was a dry creek bed in a shallow ravine now known as Medicine Tail Coulee. The exact sequence of events is difficult to establish, but it seems likely that the first sighting of soldiers at the upper end of Medicine Tail Coulee occurred at about 4 o'clock, just as the first group of soldiers was making its dash up the bluffs toward Reno Hill and Crazy Horse and his followers were turning back. Two Moons was in the Cheyenne camp when he spotted soldiers coming over an intervening ridge and descending toward the river.

Gall and three other Indians were watching the same soldiers from a high point on the eastern side of the river. Well out in front were two soldiers. Ten years later, Gall identified them as Custer and his orderly, but more probably it was not. This man he called Custer was in no hurry, Gall said. Off to Gall's right, on one of the bluffs upriver, some Indians came into sight as Custer approached. Feather Earring, a Minneconjou, said Indians were just then coming up from the south on that side of the river "in great numbers." When Custer saw them, Gall said, "his pace became slower and his actions more cautious, and finally he paused altogether to await the coming up of his command. This was the nearest point any of Custer's party ever got to the river." At that point, Gall went on, Custer "began to suspect he was in a bad scrape. From that time on Custer acted on the defensive."

Others, including Iron Hawk and Feather Earring, confirmed that Custer and his men got no closer to the river

THE BATTLE KNOWN AS the Custer Fight began when the small, leading detachment of soldiers approaching the river retreated toward higher ground at about 4:15. This was the last move the soldiers would take freely; from this moment on everything they did was in response to an Indian attack growing rapidly in intensity.

As described by Indian participants, the fighting followed the contour of the ground, and its pace was determined by the time it took for Indians to gather in force and the comparatively few minutes it took for each successive group of soldiers to be killed or driven back. The path of the battle follows a sweeping arc up out of Medicine Tail Coulee across another swale into a depression known as Deep Coulee, which in turn opens up and out into a rising slope cresting at Calhoun Ridge, rising to Calhoun Hill, and then proceeds, still rising, past a depression in the ground identified as the Keogh site to a second elevation known as Custer Hill. The high ground from Calhoun Hill to Custer Hill was what men on the plains called "a backbone." From the point where the soldiers recoiled away from the river to the lower end of Calhoun Ridge is about three-quarters of a mile—a hard, 20-minute uphill slog for a man on foot. Shave Elk, an Oglala in Crazy Horse's band, who ran the distance after his horse was shot at the outset of the fight, remembered "how tired he became before he got up there." From the bottom of Calhoun Ridge to Calhoun Hill is another uphill climb of about a quarter-mile.

But it would be a mistake to assume that all of Custer's

command—210 men—advanced in line from one point to another, down one coulee, up the other coulee and so on. Only a small detachment had approached the river. By the time this group rejoined the rest, the soldiers occupied a line from Calhoun Hill along the backbone to Custer Hill, a distance of a little over half a mile.

The uphill route from Medicine Tail Coulee over to Deep Coulee and up the ridge toward Custer Hill would have been about a mile and a half or a little more. Red Horse would later say that Custer's troops "made five different stands." In each case, combat began and ended in about ten minutes. Think of it as a running fight, as the survivors of each separate clash made their way along the backbone toward Custer at the end; in effect the command collapsed back in on itself. As described by the Indians, this phase of the battle began with the scattering of shots near Minneconjou Ford, unfolding then in brief, devastating clashes at Calhoun Ridge, Calhoun Hill and the Keogh site, climaxing in the killing of Custer and his entourage on Custer Hill and ending with the pursuit and killing of about 30 soldiers who raced on foot from Custer Hill toward the river down a deep ravine.

Back at Reno Hill, just over four miles to the south, the soldiers preparing their defenses heard three episodes of heavy firing—one at 4:25 in the afternoon, about ten minutes after Custer's soldiers turned back from their approach to Minneconjou Ford; a second about 30 minutes later; and a final burst about 15 minutes after that, dying off before 5:15. Distances were great, but the air was still, and the .45/55 caliber round of the cavalry carbine made a thunderous boom.

At 5:25 some of Reno's officers, who had ridden out with their men toward the shooting, glimpsed from Weir Point a distant hillside swarming with mounted Indians who seemed to be shooting at things on the ground. These Indians were not fighting; more likely they were finishing off the wounded, or just following the Indian custom of putting an extra bullet or arrow into an enemy's body in a gesture of triumph. Once the fighting began it never died away, the last scattering shots continuing until night fell.

The officers at Weir Point also saw a general movement of Indians—more Indians than any of them had ever encountered before—heading their way. Soon the forward elements of Reno's command were exchanging fire with them, and the soldiers quickly returned to Reno Hill.

As Custer's soldiers made their way from the river toward higher ground, the country on three sides was rapidly filling with Indians, in effect pushing as well as following the soldiers uphill. "We chased the soldiers up a long, gradual slope or hill in a direction away from the river and over the ridge where the battle began in good earnest," said Shave Elk. By the time the soldiers made a stand on "the ridge"—evidently the backbone connecting Calhoun and Custer hills—the Indians had begun to fill the coulees to the south and east. "The officers tried their utmost to keep

CONTINUED ON PAGE 94

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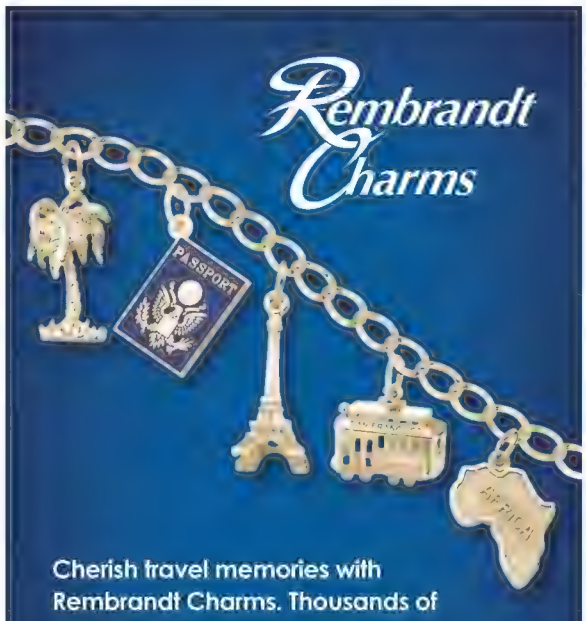

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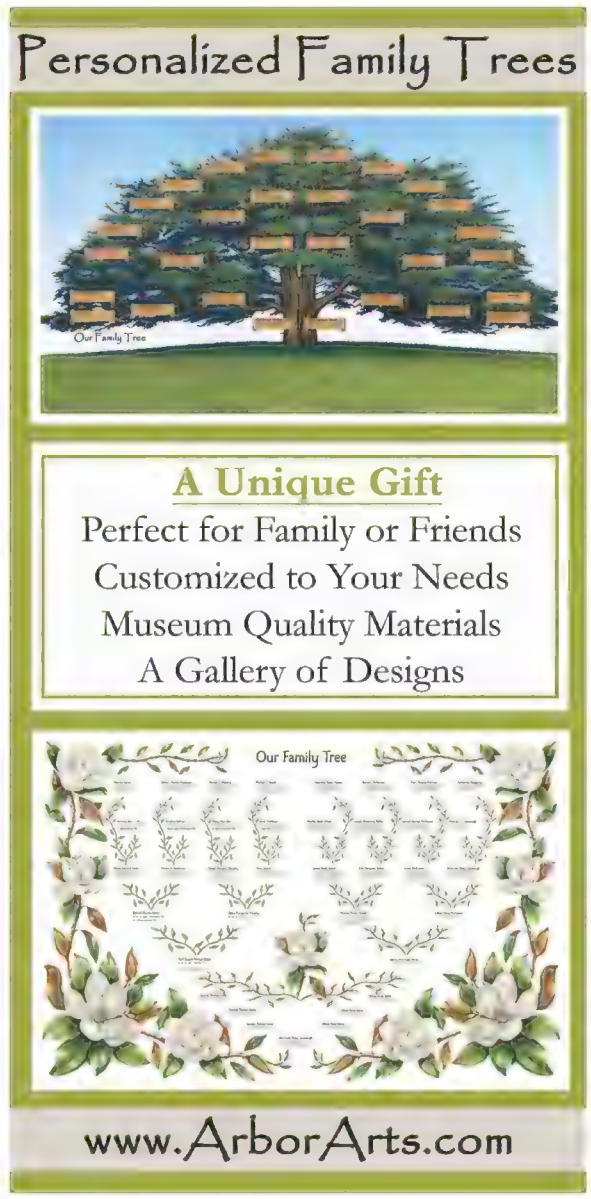
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the soldiers together at this point," said Red Hawk, "but the horses were unmanageable; they would rear up and fall backward with their riders; some would get away." Crow King said, "When they saw that they were surrounded they dismounted." This was cavalry tactics by the book. There was no other way to make a stand or maintain a stout defense. A brief period followed of deliberate fighting on foot.

As Indians arrived they got off their horses, sought cover and began to converge on the soldiers. Taking advantage of brush and every little swale or rise in the ground to hide, the Indians made their way uphill "on hands and knees," said Red Feather. From one moment to the next, the Indians popped up to shoot before dropping back down again. No man on either side could show himself without drawing fire. In battle the Indians often wore their feathers down flat to help in concealment. The soldiers appear to have taken off their hats for the same reason; a number of Indians noted hatless soldiers, some dead and some still fighting.

From their position on Calhoun Hill the soldiers were making an orderly, concerted defense. When some Indians approached, a detachment of soldiers rose up and charged downhill on foot, driving the Indians back to the lower end of Calhoun Ridge. Now the soldiers established a regulation skirmish line, each man about five yards from the next, kneeling in order to take "deliberate aim," according to Yellow Nose, a Cheyenne warrior. Some Indians noted a second skirmish line as well, stretching perhaps 100 yards away along the backbone toward Custer Hill. It was in the fighting around Calhoun Hill, many Indians reported later, that the Indians suffered the most fatalities—11 in all.

But almost as soon as the skirmish line was thrown out from Calhoun Hill, some Indians pressed in again, snaking up to shooting distance of the men on Calhoun Ridge; others made their way around to the eastern slope of the hill, where they opened a heavy, deadly fire

on soldiers holding the horses. Without horses, Custer's troops could neither charge nor flee. Loss of the horses also meant loss of the saddlebags with the reserve ammunition, about 50 rounds per man. "As soon as the soldiers on foot had marched over the ridge," the Yanktonais Daniel White Thunder later told a white missionary, he and the Indians with him "stampeded the horses . . . by waving their blankets and making a terrible noise."

"We killed all the men who were holding the horses," Gall said. When a horse holder was shot, the frightened horses would lunge about. "They tried to hold on to their horses," said Crow King, "but as we pressed closer, they let go their horses." Many charged down the hill toward the river, adding to the confusion of battle. Some of the Indians quit fighting to chase them.

The fighting was intense, bloody, at times hand to hand. Men died by knife and club as well as by gunfire. The Cheyenne Brave Bear saw an officer riding a sorrel horse shoot two Indians with his revolver before he was killed himself. Brave Bear managed to seize the horse. At almost the same moment, Yellow Nose wrenched a cavalry guidon from a soldier who had been using it as a weapon. Eagle Elk, in the thick of the fighting at Calhoun Hill, saw many men killed or horribly wounded; an Indian was "shot through the jaw and was all bloody."

Estimates of Indian dead range from 30 to 200; stones mark known casualties.

Calhoun Hill was swarming with men, Indian and white. "At this place the soldiers stood in line and made a very good fight," said Red Hawk. But the soldiers were completely exposed. Many of the men in the skirmish line died where they knelt; when their line collapsed back up the hill, the entire position was rapidly lost. It was at this moment that the Indians won the battle.

IN THE MINUTES BEFORE, the soldiers had held a single, roughly continuous line along the half-mile backbone from Calhoun Hill to Custer Hill. Men had been killed and wounded, but the force had remained largely intact. The Indians heavily outnumbered the whites, but nothing like a rout had begun. What changed everything, according to the Indians, was a sudden and unexpected charge up over the backbone by a large force of Indians on horseback. The central and controlling part Crazy Horse played in this assault was witnessed and later reported by

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many of his friends and relatives, including He Dog, Red Feather and Flying Hawk.

Recall that as Reno's men were retreating across the river and up the bluffs on the far side, Crazy Horse had headed back toward the center of camp. He had time to reach the mouth of Muskrat Creek and Medicine Tail Coulee by 4:15, just as the small detachment of soldiers observed by Gall had turned back from the river toward higher ground. Flying Hawk said he had followed Crazy Horse down the river past the center of camp. "We came to a ravine," Flying Hawk later recalled, "then we followed up the gulch to a place in the rear of the soldiers that were making the stand on the hill." From his half-protected vantage at the head of the ravine, Flying Hawk said, Crazy Horse "shot them as fast as he could load his gun."

This was one style of Sioux fighting. Another was the brave run. Typically the change from one to the other was preceded by no long discussion; a warrior simply perceived that the moment was right. He might shout: "I am going!" Or he might yell "Hokahey!" or give the war trill or clench an eagle bone whistle between his teeth and blow the piercing *scree* sound. Red Feather said Crazy Horse's moment came when the two sides were keeping low and popping up to shoot at each other—a standoff moment.

"There was a great deal of noise and confusion," said Waterman, an Arapaho warrior. "The air was heavy with powder smoke, and the Indians were all yelling." Out of this chaos, said Red Feather, Crazy Horse "came up on horseback" blowing his eagle bone whistle and riding between the length of the two lines of fighters. "Crazy Horse . . . was the bravest man I ever saw," said Waterman. "He rode closest to the soldiers, yelling to his warriors. All the soldiers were shooting at him but he was never hit."

After firing their rifles at Crazy Horse, the soldiers had to reload. It was then that the Indians rose up and charged. Among the soldiers, panic en-

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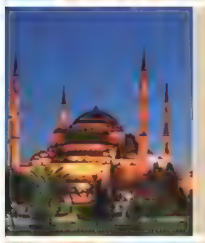

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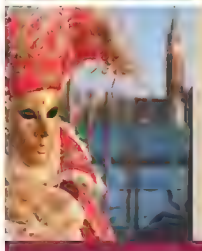

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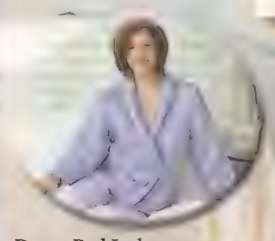

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sued; those gathered around Calhoun Hill were suddenly cut off from those stretching along the backbone toward Custer Hill, leaving each bunch vulnerable to the Indians charging them on foot and horseback.

The soldiers' way of fighting was to try to keep an enemy at bay, to kill him from a distance. The instinct of Sioux fighters was the opposite—to charge in and engage the enemy with a quirt, bow or naked hand. There is no terror in battle to equal physical contact—shouting, hot breath, the grip of a hand from a man close enough to smell. The charge of Crazy Horse brought the Indians in among the soldiers, whom they clubbed and stabbed to death.

Those soldiers still alive at the southern end of the backbone now made a run for it, grabbing horses if they could, running if they couldn't. "All were going toward the high ground at end of ridge," the Brulé Foolish Elk said.

The skirmish lines were gone. Men crowded in on each other for safety. Iron Hawk said the Indians followed close behind the fleeing soldiers. "By this time the Indians were taking the guns and cartridges of the dead soldiers and putting these to use," said Red Hawk. The boom of the Springfield carbines was coming from Indian and white fighters alike. But the killing was mostly one-sided.

In the rush of the Calhoun Hill survivors to rejoin the rest of the command, the soldiers fell in no more pattern than scattered corn. In the depression in which the body of Capt. Myles Keogh was found lay the bodies of some 20 men crowded tight around him. But the Indians describe no real fight there, just a rush without letup along the backbone, killing all the way; the line of bodies continued along the backbone. "We circled all round them," Two Moons said, "swirling like water round a stone."

Another group of the dead, ten or more, was left on the slope rising up to Custer Hill. Between this group and the hill, a distance of about 200 yards, no bodies were found. The mounted soldiers had dashed ahead, leaving the men

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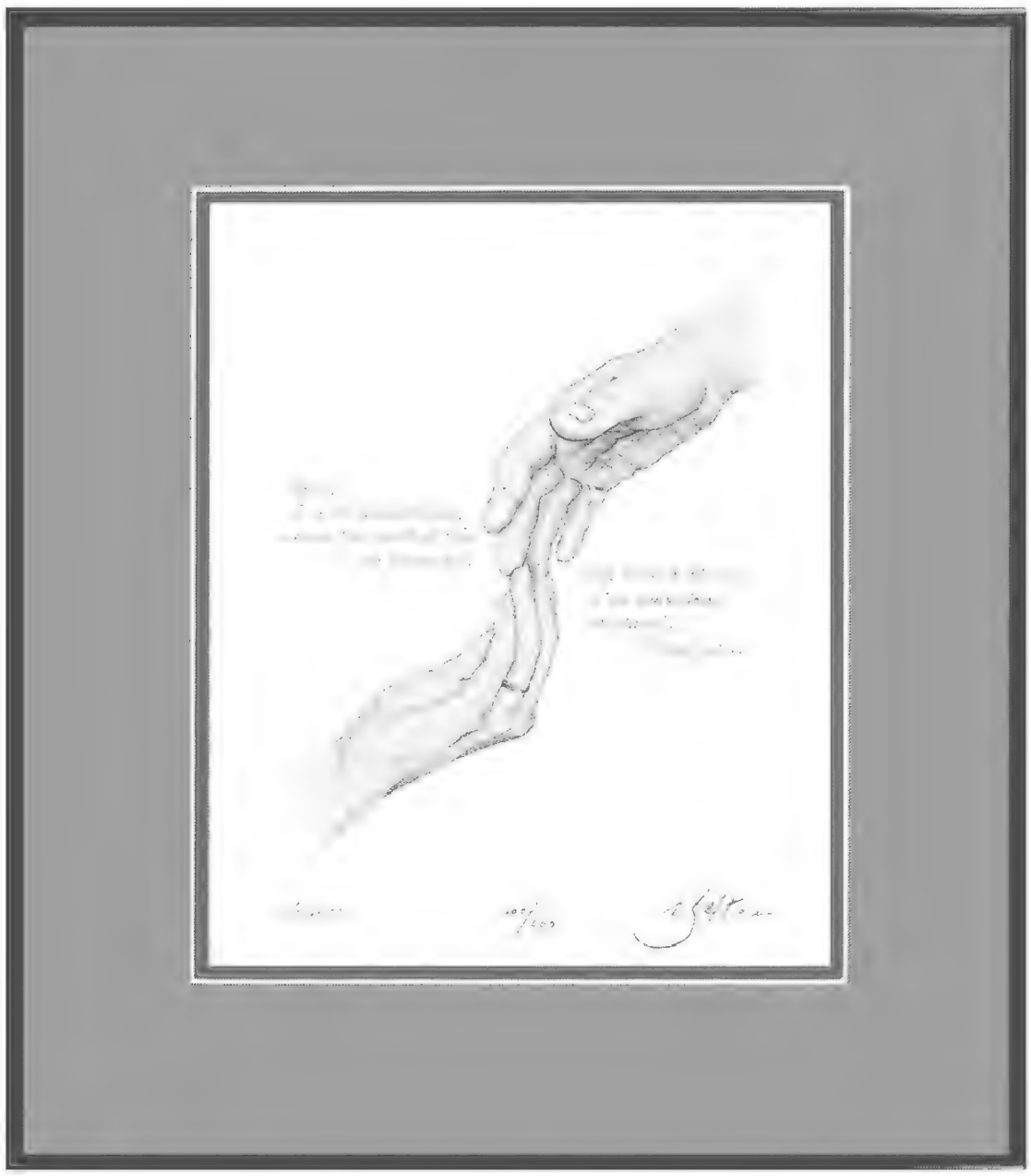

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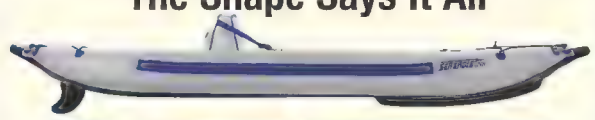

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on foot to fend for themselves. Perhaps the ten who died on the slope were all that remained of the foot soldiers; perhaps no bodies were found on that stretch of ground because organized firing from Custer Hill held the Indians at bay while soldiers ran up the slope. Whatever the cause, Indian accounts mostly agree that there was a pause in the fighting—a moment of positioning, closing in, creeping up.

The pause was brief; it offered no time for the soldiers to count survivors. By now, half of Custer's men were dead, Indians were pressing in from all sides, the horses were wounded, dead or had run off. There was nowhere to hide. "When the horses got to the top of the ridge the gray ones and bays became mingled, and the soldiers with them were all in confusion," said Foolish Elk. Then he added what no white soldier lived to tell: "The Indians were so numerous that the soldiers could not go any further, and they knew that they had to die."

The Indians surrounding the soldiers on Custer Hill were now joined by others from every section of the field, from downriver where they had been chasing horses, from along the ridge where they had stripped the dead of guns and ammunition, from upriver, where Reno's men could hear the beginning of the last heavy volley a few

After surrendering to the Army in 1877, Crazy Horse was fatally stabbed by a guard at Camp Robinson, Nebraska, during a botched attempt to arrest him.

minutes past 5. "There were great numbers of us," said Eagle Bear, an Oglala, "some on horseback, others on foot. Back and forth in front of Custer we passed, firing all of the time."

Kill Eagle, a Blackfeet Sioux, said the firing came in waves. His interviewer noted that he clapped "the palms of his hands together very fast for several minutes" to demonstrate the intensity of the firing at its height, then clapped slower, then faster, then slower, then stopped.

In the fight's final stage, the soldiers killed or wounded very few Indians. As Brave Bear later recalled: "I think Custer saw he was caught in [a] bad place and would like to have gotten out of it if he could, but he was hemmed in all around and could do nothing only to die then."

EXACTLY WHEN CUSTER died is unknown; his body was found in a pile of soldiers near the top of Custer Hill surrounded by others within a circle of dead horses. It is probable he fell during the Indians' second, brief and final charge. Before it began, Low Dog, an Oglala, had called to his followers: "This is a good day to die: follow me." The In-

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dians raced up together, a solid mass, close enough to whip each other's horses with their quirts so no man would linger. "Then every chief rushed his horse on the white soldiers, and all our warriors did the same," said Crow King.

In their terror some soldiers threw down their guns, put their hands in the air and begged to be taken prisoner. But the Sioux took only women as prisoners. Red Horse said they "did not take a single soldier, but killed all of them."

The last 40 or more of the soldiers on foot, with only a few on horseback, dashed downhill toward the river. One of the mounted men wore buckskins; Indians said he fought with a big knife. "His men were all covered with white dust," said Two Moons.

These soldiers were met by Indians coming up from the river, including Black Elk. He noted that the soldiers were moving oddly. "They were making their arms go as though they were running, but they were only walking." They were likely wounded—hobbling, lurching, throwing themselves forward in the hope of escape.

The Indians hunted them all down. The Oglala Brings Plenty and Iron Hawk killed two soldiers running up a creek bed and figured they were the last white men to die. Others said the last man dashed away on a fast horse upriver toward Reno Hill, and then inexplicably shot himself in the head with his own revolver. Still another last man, it was reported, was killed by the sons of the noted Santee warrior chief Red Top. Two Moons said no, the last man alive had braids on his shirt (i.e., a sergeant) and rode one of the remaining horses in the final rush for the river. He eluded his pursuers by rounding a hill and making his way back upriver. But just as Two Moons thought this man might escape, a Sioux shot and killed him. Of course none of these "last men" was the last to die. That distinction went to an unknown soldier lying wounded on the field.

Soon the hill was swarming with Indians—warriors putting a final bullet into enemies, and women and boys who

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had climbed the long slopes from the village. They joined the warriors who had dismounted to empty the pockets of the dead soldiers and strip them of their clothes. It was a scene of horror. Many of the bodies were mutilated, but in later years Indians did not like to talk about that. Some said they had seen it but did not know who had done it.

But soldiers going over the field in the days following the battle recorded detailed descriptions of the mutilations, and drawings made by Red Horse leave no room for doubt that they took place. Red Horse provided one of the earliest Indian accounts of the battle and, a few years later, made an extraordinary series of more than 40 large drawings of the fighting and of the dead on the field. Many pages were devoted to fallen Indians, each lying in his distinctive dress and headgear. Additional pages showed the dead soldiers, some naked, some half-stripped. Each page depicting the white dead showed severed arms, hands, legs, heads. These mutilations reflected the Indians' belief that an individual was condemned to have the body he brought with him to the afterlife.

Acts of revenge were integral to the Indians' notion of justice, and they had long memories. The Cheyenne White Necklace, then in her middle 50s and wife of Wolf Chief, had carried in her heart bitter memories of the death of a niece killed in a massacre whites committed at Sand Creek in 1864. "When they found her there, her head was cut off," she said later. Coming up the hill just after the fighting had ended, White Necklace came upon the naked body of a dead soldier. She had a hand ax in her belt. "I jumped off my horse and did the same to him," she recalled.

Most Indians claimed that no one really knew who the leader of the soldiers was until long after the battle. Others said no, there was talk of Custer the very first day. The Oglala Little Killer, 24 years old at the time, remembered that warriors sang Custer's name during the dancing in the big camp that night. Nobody knew which body was Custer's, Little Killer said, but they

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World's Fastest Wrinkle Remover? Ugly Lines Gone in 90 Seconds!

Turn back time with the new 90 Second Wrinkle Remover. Miracle beauty breakthrough makes wrinkles disappear from view instantly. See for yourself…risk FREE!

By Meg Borman

If I want to look younger I want to look younger now ... not 8 weeks from now.

That's why I fell in love with ***Instant Effect***, the new miracle **90 Second Wrinkle Remover**. Does it work? The look on my husband's face was all the proof I needed.

It felt like weeks since we'd been alone, but last weekend we snuck away for a romantic night out. No kids. No TV. Just an intimate dinner for two. So I knew this was the night for ***Instant Effect***. Before we even left the house, he gave me "the look", which I haven't seen in a long time. "Wow," he said. "You look amazing." Then he got real close, and stayed close all night.

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You can see ***Instant Effect*** working immediately. Ninety seconds is all you need to transform yourself into a radiant, younger-looking you. The quick-absorbing clear remover gently firms on contact, smoothing over ugly wrinkles. Instead of harsh chemicals injected under the skin's surface or painful procedures that permanently change your face, ***Instant Effect*** visibly erases fine line, wrinkles, crow's feet and even deep creases. And while other instant products turn chalky and crack, the scientific breakthrough technology in ***Instant Effect*** stays silky and smooth for a perfect look. You won't remember you have it on it's so comfortable. You can wear it all day….and night!

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The perfect addition to your daily routine, the **90 Second Wrinkle Remover** by ***Instant Effect*** dries instantly and invisibly, so you can wear it under your favorite makeup. Wrinkles that formed over years seem to fade before your eyes.

Instant Effect comes in an easy-to-use pump that delivers the perfect amount every time for instant results wherever you go. ***Instant Effect*** contains powerful micronized ingredients to transform problem wrinkles and fine lines anywhere into smoother, younger looking skin every time. It's the ultimate quick fix for a younger-looking you!

Not Available in Stores

You won't find the **90 Second Wrinkle Remover** by ***Instant Effect*** behind the counter at high-end boutiques and certainly not on drugstores shelves. It's only available in limited quantities direct from the laboratory. To ensure its integrity, ***Instant Effect*** is produced in small batches using our unique formula of scientifically proven ingredients. If you're serious about younger-looking skin, take the first step today and call the number below. Try it yourself, risk-free for 30 days...and wait for the "Wow."

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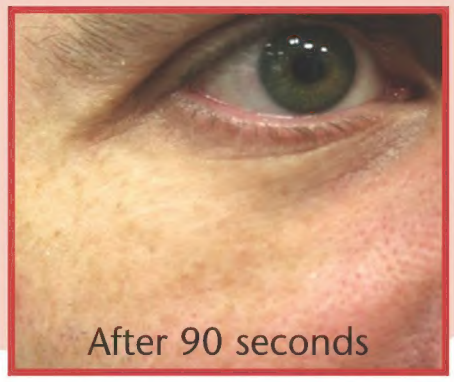

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knew he was there. Sixty years later, in 1937, he remembered a song:

Long Hair, Long Hair,
I was short of guns,
and you brought us many.
Long Hair, Long Hair,
I was short of horses,
and you brought us many.

As late as the 1920s, elderly Cheyennes said that two southern Cheyenne women had come upon the body of Custer. He had been shot in the head and in the side. They recognized Custer from the Battle of the Washita in 1868, and had seen him up close the following spring when he had come to make peace with Stone Forehead and smoked with the chiefs in the lodge of the Arrow Keeper. There Custer had promised never again to fight the Cheyennes, and Stone Forehead, to hold him to his promise, had emptied the ashes from the pipe onto Custer's boots while the general, all unknowing, sat directly beneath the Sacred Arrows that pledged him to tell the truth.

It was said that these two women were relatives of Mo-nah-se-tah, a Cheyenne girl whose father Custer's men had killed at the Washita. Many believed that Mo-nah-se-tah had been Custer's lover for a time. No matter how brief, this would have been considered a marriage according to Indian custom. On the hill at the Little Bighorn, it was told, the two southern Cheyenne women stopped some Sioux men who were going to cut up Custer's body. "He is a relative of ours," they said. The Sioux men went away.

Every Cheyenne woman routinely carried a sewing awl in a leather sheath decorated with beads or porcupine quills. The awl was used daily, for sewing clothing or lodge covers, and perhaps most frequently for keeping moccasins in repair. Now the southern Cheyenne women took their awls and pushed them deep into the ears of the man they believed to be Custer. He had not listened to Stone Forehead, they said. He had broken his promise not to fight the Cheyenne anymore. Now, they said, his hearing would be improved.

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First of all, Neutronic Ear is not a hearing aid; it is a PSAP, or Personal Sound Amplification Product. Until PSAPs, everyone was required to see the doctor, have hearing tests, have fitting appointments (numerous visits) and then pay for the instruments without any insurance coverage. These devices can cost up to $5000 each! The high cost and inconvenience drove an innovative scientist to develop the Neutronic Ear PSAP.

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Fluent in 60 Seconds

Learning a new language is a breeze—as long as it's Paionian

BY KEVIN HODGES

BY THE TIME you finish reading this paragraph you will be totally fluent in a foreign language. First, memorize this word: *monapos*, which means a bull. Next, remember this one: *tilon*, the name of a fish that once lived in Lake Prasias, Macedonia. Lastly: *paprax*, another fish that used to reside in the same lake. Congratulations, you now know every word of Paionian! Well, almost every word. There are a few surviving Paionian proper nouns—the names of specific people and places. But the people are long gone, and the places don't show up on any modern road maps.

Paionian—which was spoken in Illyria (or possibly Thrace) some 2,200 years ago—is one of many languages that have survived only as fragments. Other examples include Sicel (spoken by an indigenous tribe at least 2,800 years ago in ancient Sicily) and Raetic (spoken by inhabitants of the Eastern Alps at least 2,400 years ago). We know about them mostly because some ancient Roman or Greek author scribbled down a few scraps of vocabulary—or because some words were found on archaeological trinkets, such as coins, shovels and wine tankards. Linguists sometimes refer to these dialects as "ruinous languages," a term that suggests you'll invoke an ancient curse if you speak them. Trust me, you won't.

After years trying to learn a foreign language, I realized that my mistake was simply in choosing the wrong ones. In today's global economy, companies value multilingual individuals. Americans, in particular, are considered exceptional if they know another language.

So, how is Paionian going to help you? Step 1: Get out your laptop. Step 2: Pull up your résumé. Step 3: Add the following phrase: "Fluent in Paionian." This should take your career to a new level. And try to find a way to mention Paionian during your next job interview.

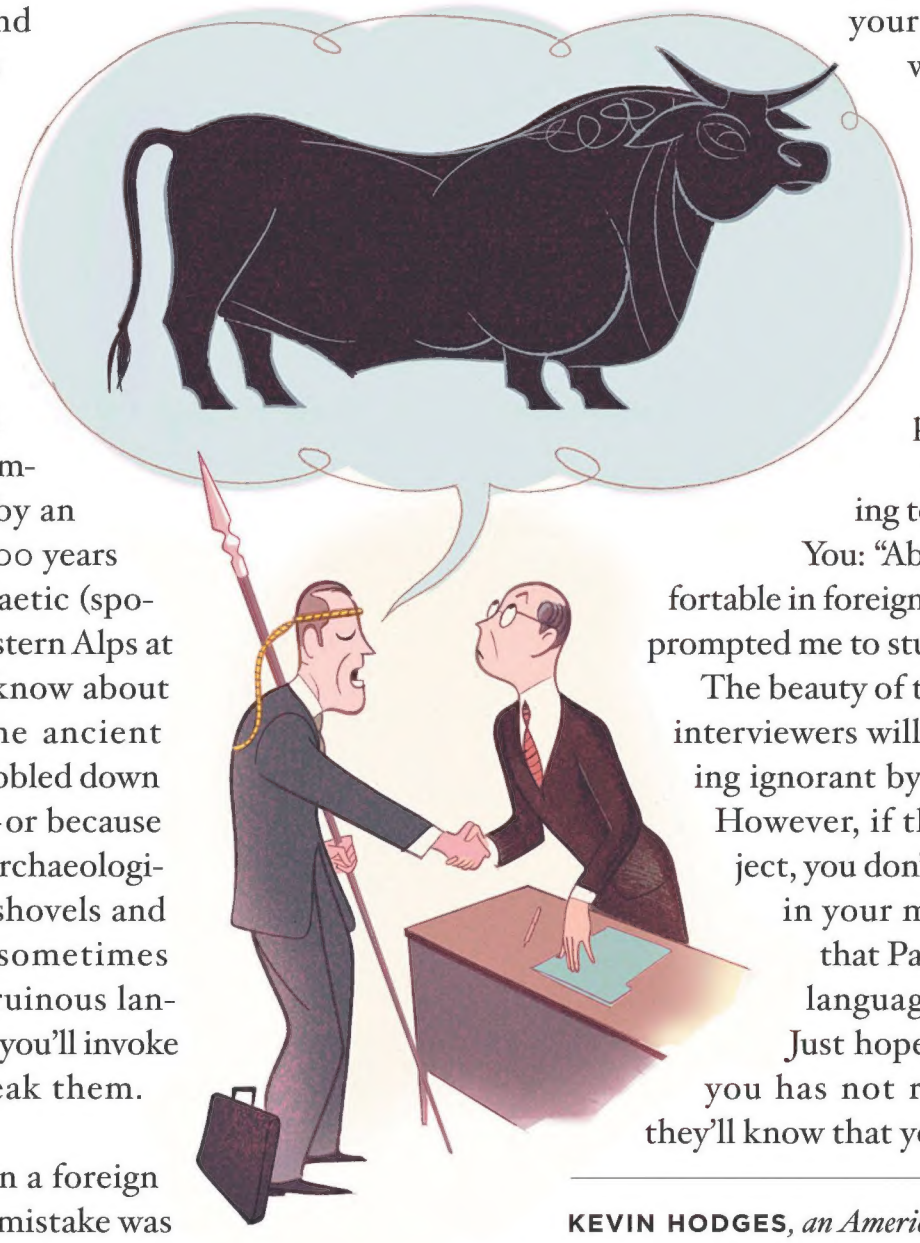
Question: "So, what would be your greatest strength if you were chosen for this job?"

You: "I believe the perseverance and mental discipline I gained from learning Paionian have given me the skills to meet any challenges this position may present."

Question: "Are you willing to travel abroad?"

You: "Absolutely. I feel quite comfortable in foreign cultures. That's what first prompted me to study Paionian."

The beauty of this approach is that most interviewers will not want to risk appearing ignorant by asking what Paionian is. However, if they do bring up the subject, you don't have to lie. Simply say—in your most nonchalant voice—that Paionian is a Mediterranean language, spoken for centuries. Just hope the person interviewing you has not read this column. Then they'll know that you're full of *monapos*.



ERIC PALMA

KEVIN HODGES, *an American writer and linguist, left corporate life for a village in Nepal.*